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From the Editor

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Welcome to the Middle-East Journal of Internal Medicine.

In this third issue of the journal this year we have a rich number of papers from the region and from Europe. In this issue two papers deal with diabetes mellitus. A paper from KSA looked at the significance of waist circumference in diabetes mellitus. The authors stressed that much research conducted to explore the link between occurrence of diabetes and disturbed metabolic pathways and abnormal distribution of some tissues such as fatty tissues. In their review the authors attempted to answer if the waist circumference is of significant value in diabetes mellitus. The second paper on Diabetes from Iraq looked at whether there was any difference in glycemic control if we started patients with type 2 diabetes mellitus, on NPH or premixd insulin. This was an open-label, prospective study. In the first month they enrolled 1500 patients with suboptimal glycemic control (HbA1c ?7%). Both NPH or Premixed insulin was used for alternating patients, and started twice daily in a dose of 0.2 unit /kg/d. Premixed insulin was used in 66.8 % and NPH in 33.2 %. Target HbA1c was achieved in 12.4 % of patients at the end of one year. This observational study suggests that in diabetic patients with failing OADs, starting with NPH or premixed human insulin makes no significant difference to the outcome for at least one year.

A retrospective study of 521 patients admitted to the burn unit at King Hussein Medical Center, Royal Medical Services in Jordan looked at the Mortality Rate in the Burn Unit and identified risk factors associated with burn injuries in order to provide improved methods and recommendations to decrease mortality rate and obtain a better outcome. The study revealed an overall mortality rate in the burn unit during the study period of 13.5 %, where 69 patients died. The main determinants in mortality rate in this study are shown to be TBSA burn with above 40% and direct flame burn (DFB) as the fatal factors. The authors revealed that delay in referral to the burn unit was shown to play a minor role in mortality secondary to inappropriate resuscitation and set-up in other hospitals. Low threshold for immediate intubation in DFB with more than 40% TBSA regardless of signs of inhalational injury should be considered.

A paper from the UK looked at the effects of different kinds of analgesics on duration of labour. The author stressed that Labour pain is a main distress to many patients. Pain involves many aspects, for instance, culture, ethnicity, and psychosocial factors. The study involved 4,509 patients undergoing labour at Birmingham Women's Hospital (BWH). The study design was non-experimental; a retrospective cohort collected through tracing the patients' record from the archives of Birmingham Women's Hospital, for women who had delivered vaginally. The author noted that Entonox was associated with the shortest duration of labour stage-1 (6 hours), and stage-2 (25 minutes), compared to the Epidural analgesia, which was associated with longer labour, $p<0.05$ and with some complications for the mother and the foetus, $p<0.05$. Pethidine was associated with a lower APGAR score at 5-minutes (below 7). The overall conclusion; Entonox seems to provide the safest method of analgesia and is associated with the shortest labour compared to the other studied analgesic protocols. Therefore this will encourage clinicians to apply it safely during labour.

A paper from Bangladesh looked at the cost analysis of different types of cancer treatments and their effects on household expenditure. The mean Household expenditure on food for Radio, Chemo or both radiotherapy and chemotherapy patients were 5427.78 taka, 4788.73 taka and 6855.77 taka respectively which varied significantly. In this study positive relationships were found between the types of treatment and the expenditure on food & transport costs. The costs of the treatments were much higher than the national standard of the household expenditure on medical care. For the patients who had Radiotherapy the mean cost of lost assets, earning wage loss & the total amount of loans were 20214.29 taka, 29160.00 taka, and 33217.46 taka respectively.

Haddad, et al looked at the Role of B-scan ultrasonography in the pre-operative assessment of the posterior eye segment in patients with dense cataract They followed a prospective study conducted in Prince Rashed Hospital. All patients with dense cataract preventing visualization of dilated fundus were enrolled in this study. 296 patients were included in our study. Abnormal eye ultrasound was present in 24.3% of patients. Diabetes, hypertension and age younger than 52 years with eye trauma are associated with a high incidence of posterior segment abnormalities. It is recommended to use B-scan ultrasonography routinely for the detection of hidden posterior segment lesions pre-operatively in cataract patients; it may influence the surgical strategy and gives idea about postoperative visual prognosis.

A paper from Sulaimani city looked at the Seed oil composition of red raspberry (Rubus ideaus) fruit. The authors stressed that the seed oil component of red raspberry fruit which grows in Sulaimani city-Iraq was determined. Analysis of Seed oil composition of red raspberry fruit shows 10.5mg/100gm of alpha tocopherol, 17.5mg/100gm of gamma tocopherol, the total tocopherol is 29.0mg/100gm. It has been found that the seed oil studied of red raspberry fruit contains fatty acids like palmatic acid 3.0%, stearic acid 1.2% , oleic acid 12.0% , linoleic acid 53.2% , and linolenic acid 30.0% .

Mortality Rate in Burn Unit: A Six Years Study at the Burn Unit in the King Hussein Medical Center, Royal Medical Services, Jordan

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ABSTRACT

Objective: To study the mortality rate of burn cases admitted to the Burn Unit in Royal Medical Services and identify risk factors associated with burn injuries in order to provide improved methods and recommendations to decrease mortality rate and obtain a better outcome.

Methods: This is a retrospective study of 521 patients admitted to the Burn Unit at King Hussein Medical Center, Royal Medical Services in Jordan for the period January 2005 to December 2010. Data was collected from patients' records regarding age, gender, total body surface area (TBSA) burn, cause of burn, date of burn, date of arrival to hospital (DOB and DOA respectively), and mortality rate. Correlation between mortality rate and the above mentioned risk factors was studied using direct comparison through tables, bar graphs and pie charts.

Result: Overall mortality rate in the burn unit during the study period was found to be 13.5 % where 69 patients died. Regarding age groups, the highest mortality rate was associated with ages above 14 years where 57 out of 299 patients died (19.1%); while it was 5.4% for ages 14 and below (12 out of 221 died). Mortality rate among female patients was 15.3% where 32 out of 209 female patients died, and among male patients 11.9% where 37 out of 312 male patients died. Mortality rate for patients with less than 40% TBSA was 3.1% (13 out of 413 died) and the rate for patients with TBSA equal or more than 40% was 51.9% (56 of 108 patients). Direct flame burn was responsible for 89.9% of deaths in this study (62 patients), while scald and electrical burns were nearly equal with approximately 3.6% each (5 patients) and the remaining 2 patients were associated with other causes of burn. 29 of the 69 deceased patients had respiratory problems that required intubation before arrest (41.3%), while 22 patients had sepsis (32.1%) and 18 patients (26.6%) had a combination of both which lead to multiple organ failure.

Approximately 75% of deceased patients were admitted to the unit on the same day the burn occurred (52 patients) while 17 patients (25%) were admitted 1 - 20 days later.

Conclusion: The main determinants in mortality rate in this study are shown to be TBSA burn with above 40% and direct flame burn (DFB) as the fatal factors.

Delay in referral to the burn unit was shown to play a minor role in mortality secondary to inappropriate resuscitation and set-up in other hospitals.

Low threshold for immediate intubation in DFB with more than 40% TBSA regardless of signs of inhalational injury should be considered.

Key Words: Burns, Mortality, Total Body Surface Area (TBSA), direct flame burn.

Introduction

Burn is a kind of injury that affects mainly the skin in most cases, but also may affect deeper tissues depending on the degree of burn. What causes a burn is a wide list that ranges from direct flame burn (DFB), scald burn, electrical burn and chemical burns. A burn injury can vary in its severity and effect on the patient. It can be so mild that it can managed at home, moderate that might need hospitalization for local wound care or it can be a severe burn that needs admission to the burn unit, a highly specialized unit for the care of such severe cases that can lead to death.

Burn injury not only affects the patient's physical condition, psychological status and his/her family, it is also a burden on the community. Our burn unit, which is the largest and best prepared in our country, is part of the royal rehabilitation center, a main hospital in the Royal Medical Services of Jordan. It contains 9 beds, and is served by well trained doctors and very qualified nursing staff with a one to one nurse to patient ratio.

Our study is about the mortality rate of burn cases admitted to the Burn unit and identify risk factors associated with burn injuries in order to provide improved methods and recommendations to decrease mortality rate and obtain a better outcome.

Methods

This is a retrospective study of 521 patients admitted to the burn unit at the royal rehabilitation center, Royal Medical Services in Jordan for the period January 2005 to December 2010. Data was collected from patients' records regarding age, gender, total body surface area (TBSA) burn, cause of burn, date of burn and date of arrival (DOB and DOA respectively), and mortality rate. Correlation between mortality rate and the above mentioned risk factors was studied using direct comparison through tables, bar graphs and pie charts.

Results

A quick review of all admissions to the burn unit since January 2005 till December 2010 was done, taking into consideration causes of burn, age groups, gender and mortality rate. A specific review of dead patients during that period in the burn unit was done with correlation with some variables. Overall mortality rate in the burn unit during the study period was found to be 13.5 % where 69 patients died (Table 1 - opposite).

The annual distribution of mortality rate did not decrease much (Figure 1 & Table 2).

Regarding age groups, patients were divided into two groups, those who are among the pediatric age group, (<14 years) and those who are considered in the adult age group (>14 years). The highest mortality rate was associated with ages above 14 years where 57 out of 299 patients died (19.1%); while it was 5.4% for ages 14 and below (12 out of 221 died), (Table 3).

Mortality rate among female patients was 15.3% where 32 out of 209 female patients died, and among male patients 11.9% where 37 out of 312 male patients died, (Table 4).
Figure 2 (page 6) summarizes the previous data.

TBSA in the deceased patients was also divided into two groups, more than or less than 40 %. Mortality rate for patients with less than 40% TBSA was 3.1% (13 out of 413 died) and the rate for patients with TBSA equal or more than 40% was 51.9% (56 of 108 patients) (Table 5 - page 6).

Regarding causes of burn, Direct flame burn was the major leading cause of death and was responsible for 89.9% of deaths in this study (62 patients), while scald and electrical burns were nearly equal with approximately 3.6% each (5 patients) and the remaining 2 patients were associated with other causes of burn (Figure 3 - page 6).

Medical complications were evidenced in many of the deceased patients before their death and we think it was the leading to the end result. 29 of the 69 deceased patients had respiratory problems that required intubation before arrest (41.3%), while 22 patients had sepsis (32.1%) and 18 patients (26.6%) had a combination of both which lead to multiple organ failure (Table 6 - page 6).

Approximately 75% of deceased patients were admitted to the unit on the same day the burn occurred (52 patients) while 17 patients (25%) were admitted 1 - 20 days later.

Discussion

As we included in our study some independent variables, we agreed with other authors in different studies about them(4,5). These are: age, gender, TBSA, presence of inhalational injury.

In our study, the overall mortality rate was 13.5% , which is lower than the study done by De-Souza et al(1) and Mukerji G(2) et al and higher than other studies(13,14).

This difference may be partly explained by the varying severity of burns, If we compare only the patients with an equal burned BSA, the mortality rate observed in our unit is similar to that of other centers. De-Souza et al.(1) reported a mortality rate of 59.4% for patients with burned BSA of more than 40%. We found 56% mortality rate in our unit for patients with burned BSA more than 40%. In this study, the elderly patients' (over 65 years old) mortality rate was (41.7%), which is higher than the younger patient group (younger than 65 years old) 13.4%. Nguyen et al(4) reported that the effective initial management of burns considerably reduced the risk of morbidity and mortality, and since most of our patients were referred to our unit from other cities by a land ambulance, or referred to us from other countries, a higher mortality rate is explainable. As we showed in Table 2, the yearly mortality rate did not decrease; we think that the reason for r that is the delay in referral or presentation, and also inappropriate resuscitation(6,7,9) .

	No.	%
Total Patients	521	100%
Patients Died	69	13.2%
Patients Survived	452	86.8%

Table 1: Overall Mortality

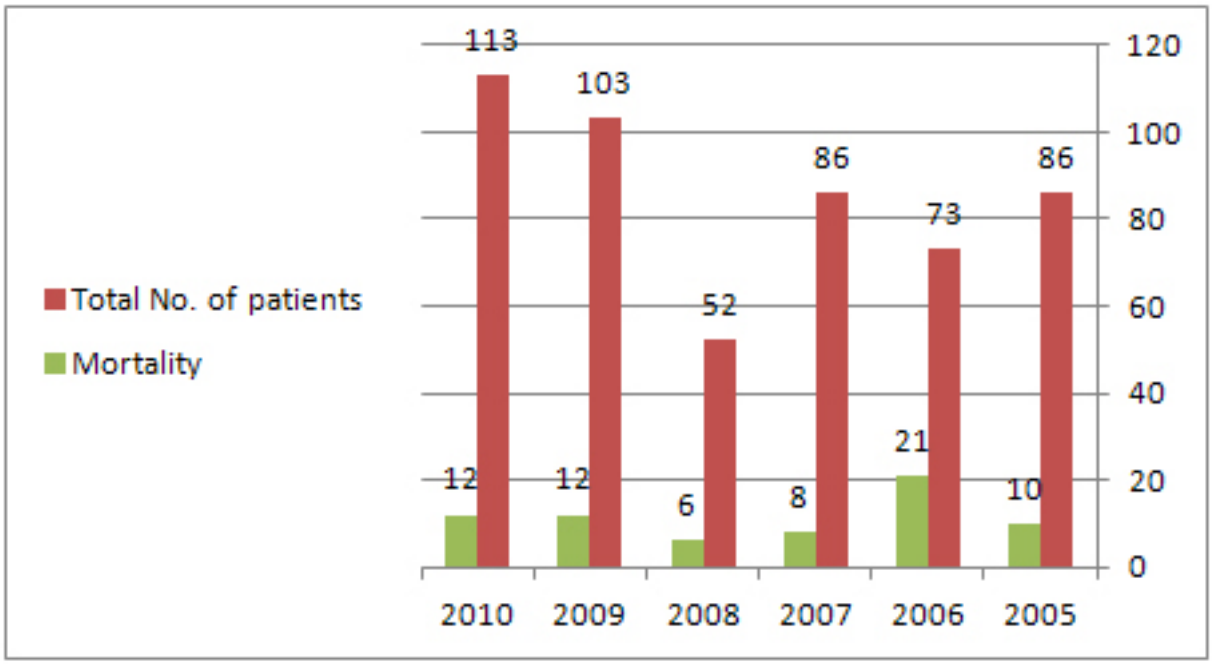

Figure 1.The annual distribution of mortality rate

Year	Total No. of patients	Mortality	%
2005	86	10	11.6%
2006	73	21	28.8%
2007	86	8	9.3%
2008	52	6	11.5%
2009	103	12	11.7%
2010	113	12	10.6%

Table 2: Yearly Distribution of Mortality Rate

	Total No. in group	Mortality	%
Above 14 years	299	57	19.1%
14 years and below	221	12	5.4%

Table 3: Age Groups

	Total No. in group	Mortality	%
Male	312	37	11.9%
Female	209	32	15.3%

Table 4: Gender

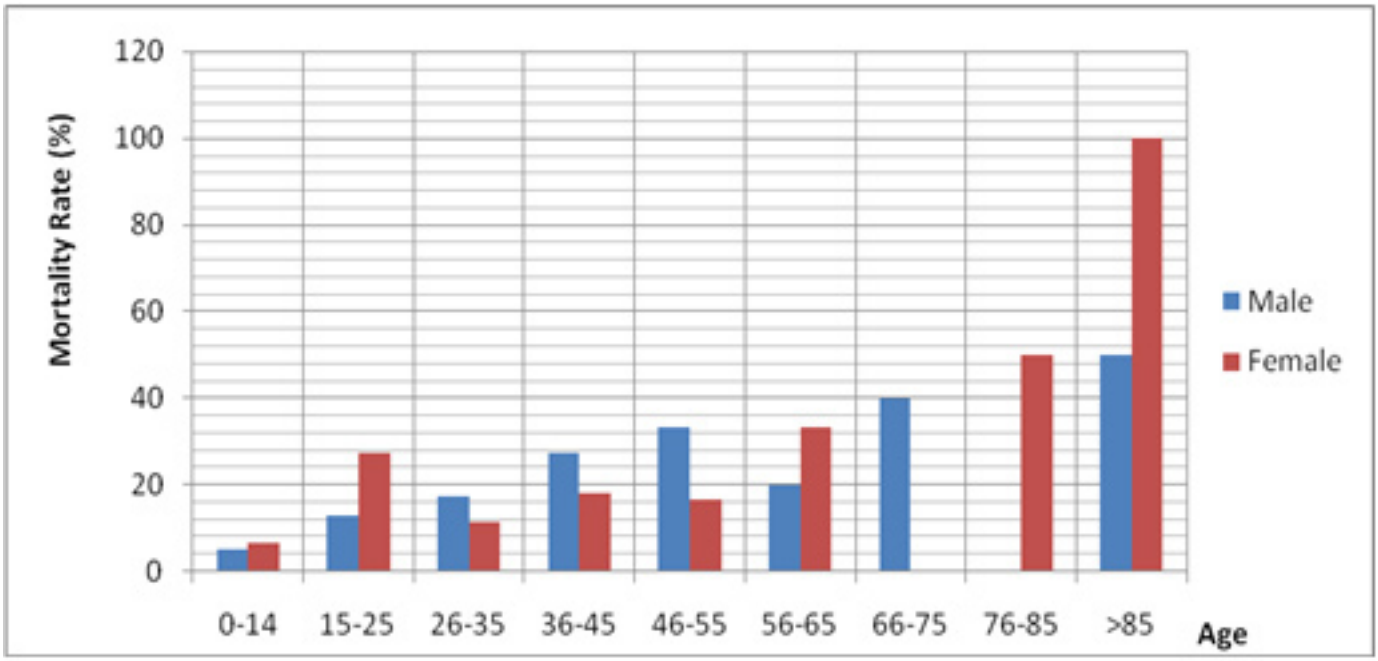

Figure 2. Mortality rate according to age and gender among the study group

	Total No. in group	Mortality	%
Less than 40% TBSA	413	13	3.1%
TBSA 40% and above	108	56	51.9%

Table 5: TBSA Burn

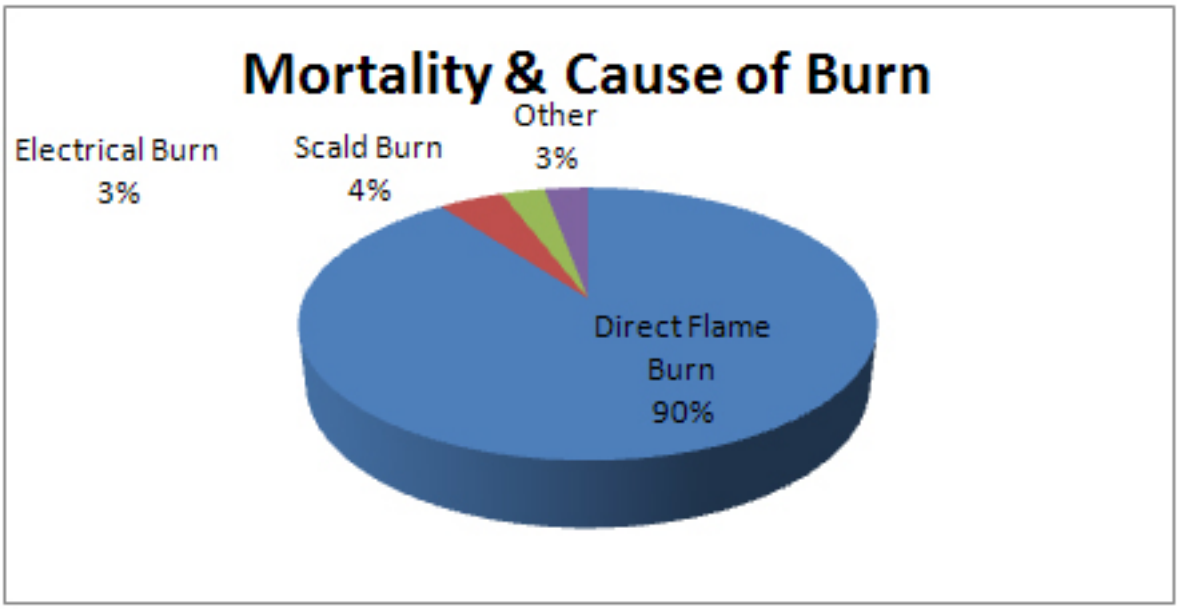

Figure 3: Mortality & Cause of Burn

	No.	%
Respiratory problems	29	42.0%
Sepsis	22	31.9%
Both	18	26.1%
Total	69	

Table 6: Sepsis & Respiratory problems

We found that mortality rate was found to be highest in the adult age group (those >14 years). We believe that the nature of burn is of most importance in predicting mortality regarding age factor, that is to say that most of the pediatrics burns are scald burns while adults presentsmostly with DFB with associated inhalational injury(12).

The females showed a little higher mortality rate than males in the adult age group.

Our study agrees with most of other studies in the fact that the more the TBSA the more the mortality and morbidity associated with the burn. We found that TBSA 40% and more is the triggering percentage at which the mortality rate shoots up in a dramatic way.

Direct Flame burn was the nightmare that our unit faced. It carried the highest mortality rate among adult age groups. Most of our population still use gasoline filled heaters in winter time, and wrong dealing with such heaters and gasoline leads to disastrous scenarios. It is the associated respiratory failure and inhalational injury that cause the deterioration in their clinical condition, as shown in the study that was made by Wolf SE et al(6).

Medical complications following admission to our burn unit in the deceased patients were mostly respiratory secondary to inhalational injury, followed by sepsis then multi organ failure. In other studies (5) septicemia shock was the main complication and Herruzo R et al(10) emphasizes on the fact that longer stay for more than 10 days in burn unit shows a higher mortality rate due to more incidence of septicemia. Other authors (7,11) show that multi organ failure is the leader to death after admission to burn unit in severely burned patients, and early resuscitation decreases such end organ failure.

Conclusion

The main determinants in mortality rate in this study are shown to be TBSA burn with above 40% and direct flame burn (DFB) as the fatal factors.

Delay in referral to the burn unit was shown to play a minor role in mortality secondary to inappropriate resuscitation and set-up in other hospitals.

Some authors emphasis increase of nursing numbers, early enteral nutrition and expert local wound care can influence survival rate, which we agree with through our own experience with the early arrived, well resuscitated patients.

Low threshold for immediate intubation in DFB with more than 40% TBSA regardless of signs of inhalational injury should be considered.

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Basal Insulin versus premixed human insulin in insulin naive patients with type 2 diabetes mellitus. A randomised trial from Basrah

ABSTRACT

Background: Type 2 diabetic patients failing oral antidiabetes (OADs) medications need insulin. The aim of this study is to see if there was any difference in glycemic control if we started insulin naive patients with type 2 diabetes mellitus, on NPH or premixed insulin.

Patients and methods: This was an open-label, prospective study. Throughout July 2009, we enrolled insulin naïve patients with type 2 diabetes mellitus in the Al-Faiha Diabetes and Endocrine Center in Basrah. In the first month we enrolled 1500 patients with suboptimal glycemic control (HbA1c > 7%) despite increasingly aggressive therapy with OADs in addition to lifestyle changes, but only 791 (52.7%) patients continued the study for 12 months. Both NPH or Premixed insulin was used for alternating patients, and started twice daily in a dose of 0.2 unit /kg/d. Secretogogus was stopped on commencing insulin, but metformin was continued.

Results: Premixed insulin was used in 66.8 % and NPH in 33.2 %. Target HbA1c was achieved in 12.4 % of patients at the end of one year. The NPH group significantly had a higher age, 55.7±10.4 vs. 52.5±11.6 (OR, 2.805; 95% CI, 1.636-4.966; p <0.0001). HbA1c was slightly, but significantly statistically lower, in the premixed group 8.8± 1.5 vs. 8.5±1.4, (OR, 1.659; 95% CI, 0.106 -0.546; p =0.004). There was no statistically significant difference between the two groups regarding achieving the target HbA1c.

Conclusion: This observational study suggests that in diabetic patients with failing OADs, starting with NPH or premixed human insulin makes no significant difference to the outcome for at least one year.

Key words: type 2 diabetes mellitus, insulin, HbA1c, basal insulin, human neutral protamine hagedorn

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Background

Type 2 diabetic patients failing oral antidiabetes (OADs) medications need insulin.(1) There is no agreed upon optimal mode of initiating insulin in this situation. Adding human neutral protamine hagedorn (NPH) insulin at bedtime or 70/30 premixed insulin (human premixed insulin 30% regular, 70% NPH insulin) at suppertime to the oral medications has been studied.

Long-acting insulin analogues in type 2 diabetic patients do not seem to provide a better glycemic control in comparison with NPH insulin, whereas it reduces the risk of nocturnal and symptomatic hypoglycemia.(2) The NICE guidance recommends initiating insulin with NPH (isophane) insulin or a long-acting analogue for failing OADs in type 2 diabetes mellitus. (3)

The progressive deterioration of β-cell function that characterizes the natural history of type 2 diabetes suggests that earlier initiation of insulin therapy may protect β cells from the increasing functional impairment caused by extended exposure to hyperglycemia.(4) Even aggressive insulin regimen to restore glycemic control in the early stages of type 2 diabetes, thus reducing glucose toxicity, may have long-lasting benefits, including the restoration of β-cell function and possible reduction in the rate of β-cell deterioration.

In Iraq, human insulin is still the only insulin used for the majority of diabetic patients. The drug is supplied centrally by the MOH to the 18 governorates, and via public clinic, diabetic clinic, diabetic centres, and hospitals, it is supplied to patients.(5) The fund is mainly from the government, and the drug is sold cheaply to the patients. The decision regarding insulin is usually done by the primary care physician or internist and to a less extent, by an endocrinologist. We have

three main human insulins used in diabetes mellitus; the regular insulin, NPH insulin and premixed insulin. Doctors and patients always prefer premixed insulin because it is given twice, while the doctors believe it gives less control. That is the reason the premixed is not always available in the distribution centers, because most doctors started insulin in type 2 diabetes on premixed insulin and avoid NPH or regular insulin to avoid more than two injections. They are usually delivered by syringes and to a lesser extent, by pen.

Furthermore most HbA1c estimation methods in Iraq are not according to the NGSP and IFCC certified method. That is why the decision of insulin based on HbA1c is only available in few centres, till late 2010. The hospitals mainly used manual methods like Human or Stanbio direct HbA1c assay (Reference No. 0360-040), which are not certified by NGSP and IFCC.

The aim of this study is to observe if there was any difference in glycemic control if we started insulin naïve patients with type 2 diabetes mellitus, on NPH or premixed insulin.

Patients and Methods

Individuals with diabetes from the Al-Faiha Diabetes and Endocrine Center in Basrah were included in the current analysis if they had been on OADs (sulfonylurea plus metformin) in addition to lifestyle changes, prior to switching to insulin. Secretogogus was stopped on commencing insulin. This was a 12 month parallel group, open-label, prospective study.

Throughout July 2009, we enrolled insulin naïve patients with type 2 diabetes mellitus. In the first month we enrolled 1500 patients with suboptimal glycemic control (HbA1c > 7%) despite increasingly aggressive therapy with OADs in addition to lifestyle changes, but only 791 (52.7%) patients continued the study to 12 months. Data analysis was done at the beginning of July 2010. This high dropout and low enrolment numbers were because we excluded before and during the study, the following: those on insulin, pregnant women, defaulters for more than 3 months, type 1 diabetes, those with recent diabetic foot, acute coronary syndrome with admission to CCU, stroke or acute medical illness which needed hospitalisation for intensive control using a basal-bolus regimen of insulin.

HbA1c was measured at enrolment and after 12 months. Life style changes and metformin were used for all unless there was a contraindication.

Both NPH and Premixed insulin was started twice daily in a dose of 0.2 unit /kg/d. Insulin doses were titrated every month for the first 3months, according to fasting and prandial plasma glucose and then each 3 months according to HbA1c. The dose changed monthly according to fasting and prandial glucose levels and every 3 months by HbA1c level.

NPH and Premixed insulin were used for alternating patients and continued for one year. Those with failure of control by 3 months were reinforced for lifestyle and metformin therapy and their metformin dose was optimized to 1,700 -2,550 mg, but if the hyperglycemia was gross, they were shifted to another regimen and excluded from the study. The primary objective of the study was to assess HbA1c at the end of the study.

Body Mass Index (BMI, kg/m2) was computed from all height and weight measurements.

HbA1c was measured using Bio-Rad D10 analyzer (HPLC cation-exchange chromatography). Ethical approval for this study was obtained from the Basrah Directorate of Health.

Statistical analysis

Baseline characteristics of the diabetes population were compared using a t-test for continuous variables and a Chi-squared test for dichotomous variables respectively. Means and standard deviations were reported for continuous variables, proportions for dichotomous variables.

Results

Table 1 (next page) shows the characteristics of patients. Of 791 patients enrolled, 303 (38.3%) were men, with mean age of 53.6±11.1 years and BMI of 5.8± 5.0. Premixed insulin was used in 66.8 % and NPH in 33.2 %.

The insulin was started 8.6±6.9 years after diagnosis with a median of 7 years. At the time of enrollment and before the use of insulin the mean HbA1c was 10.4±1.7 percent with median HbA1c 10.4 % and after one year of insulin therapy it was 8.6 ±1.4 percent with a median HbA1c 8.4 %. Target HbA1c was achieved by 12.4 % of patients at the end of one year.

Table 2 shows the demography, onset of insulin use and HbA1c according to the type of insulin. There were no differences between both study groups regarding the gender, or BMI but the NPH group had a significantly higher age at 55.7±10.4 vs. 52.5±11.6 (OR, 2.805; 95% CI, 1.636-4.966; p <0.0001).

There was no statistically significant difference between both groups regarding HbA1c before the enrollment, but HbA1c was slightly but significantly statistically lower in the premixed group (Figure 1 - page 11) 8.8± 1.5 vs. 8.5±1.4, (OR, 1.659; 95% CI, 0.106 -0.546; p =0.004). There was no statistically significant difference between the two groups regarding achieving the target HbA1c (Figure 2 - page 11).

Gender	Men No. (%)	303(38.3)	
	Women No. (%)	488(61.7)	
Age (Year) mean ±SD		53.6±11.1	
BMI mean ±SD		25.8± 5.0	
The start of insulin after diagnosis (Year)*		8.6±6.9	Median 7.0
Type of insulin used	NPH No. (%)	263(33.2)	
	Premixed No. (%)	528(66.8)	
HbA1c before insulin use mean ±SD		10.4±1.7	Median 10.4
HbA1c after insulin use mean ±SD		8.6 ±1.4	Median 8.4
HbA1c < 7 % after insulin use No. (%)		98 (12.4)	
*from the time of diagnosis of diabetes mellitus.			

Table 1: Characteristics of patients (n=791)

		NPH No. 263	Premixed No. 258	P value	Odds Ratios (95% CI)
Gender	Men No. (%)	109 (41.4)	194(36.7)	0.214	2.190 (1.510-4.794)
	Women No. (%)	154(58.6)	334(63.3)		
Age (Year) mean ±SD		55.7±10.4	52.5±11.6	**<0.0001**	2.805 (1.636-4.966)
BMI kg/m^2 mean ±SD		25.9±5.0	25.7±5.1	0.639	0.248(-0.577 - 0.940)
The start of insulin after diagnosis (Year) mean ±SD		8.7±6.6	8.6±7.1	0.736	0.457 (-0.854- 1.208)
HbA1c before insulin use mean ±SD		10.5±1.7	10.4±1.7	0.720	0.002 (-0.209- 0.303)
HbA1c after insulin use mean ±SD		8.8± 1.5	8.5±1.4	**0.004**	1.659 (0.106 - 0.546)
HbA1c < 7 % after insulin use No. (%)		28 (10.6)	70 (13.3)	0.294	4.530 (-0.022 -0 .074)

Table 2: Demography, onset of insulin and HbA1c according to the type of insulin used

Discussion

When patients are unable to reach HbA1c goals despite adequate titration of basal insulin, either postprandial hyperglycemia or a lack of regimen adherence is usually to blame. There are no clinical trials to determine the best approach at this stage.(6) In our study, only 12.4 % of our patients achieved the target HbA1C by the end of one year and there was no statistical difference between the two groups regarding achieving the target HbA1c.

A retrospective cohort study by Rubino et al, found glycemic control with the initial insulin regimen was suboptimal for the majority of patients: 6 months after starting insulin, HbA1C was still 7.5% or higher in 74% of patients . (7) Moisey et al found metformin with basal insulin was as effective as metformin with premixed human insulin over a mean period of 3.8 years regarding HbA1c, with lower dose of insulin used and less weight gain in the basal human insulin group. (8)

Adding NPH insulin at bedtime has yielded similar improvements in control as two or more injections of insulin for 3 (9) , 6 (10), or 12 (11) months. (1)

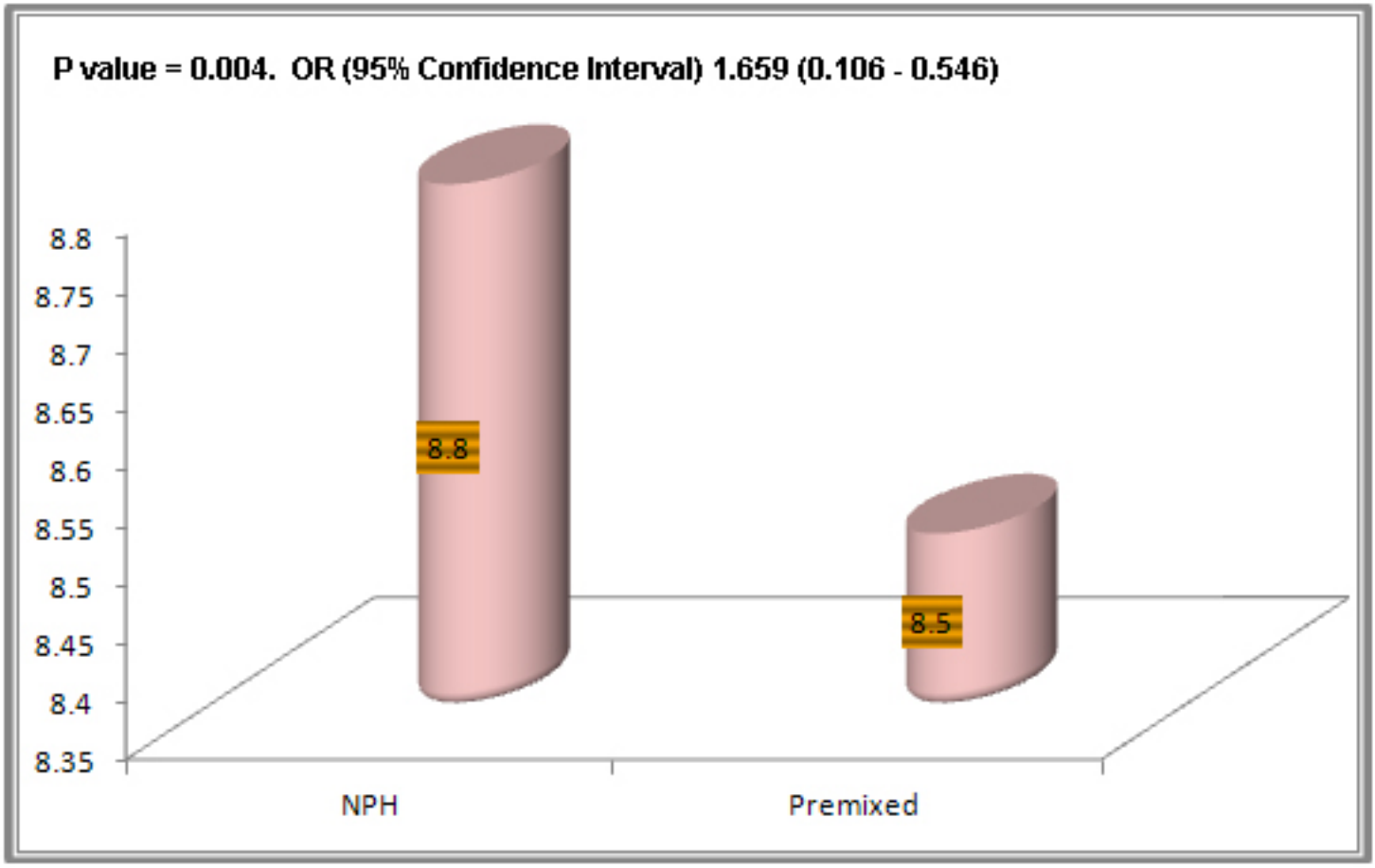

Figure 1: Mean HbA1c achieved at end of study

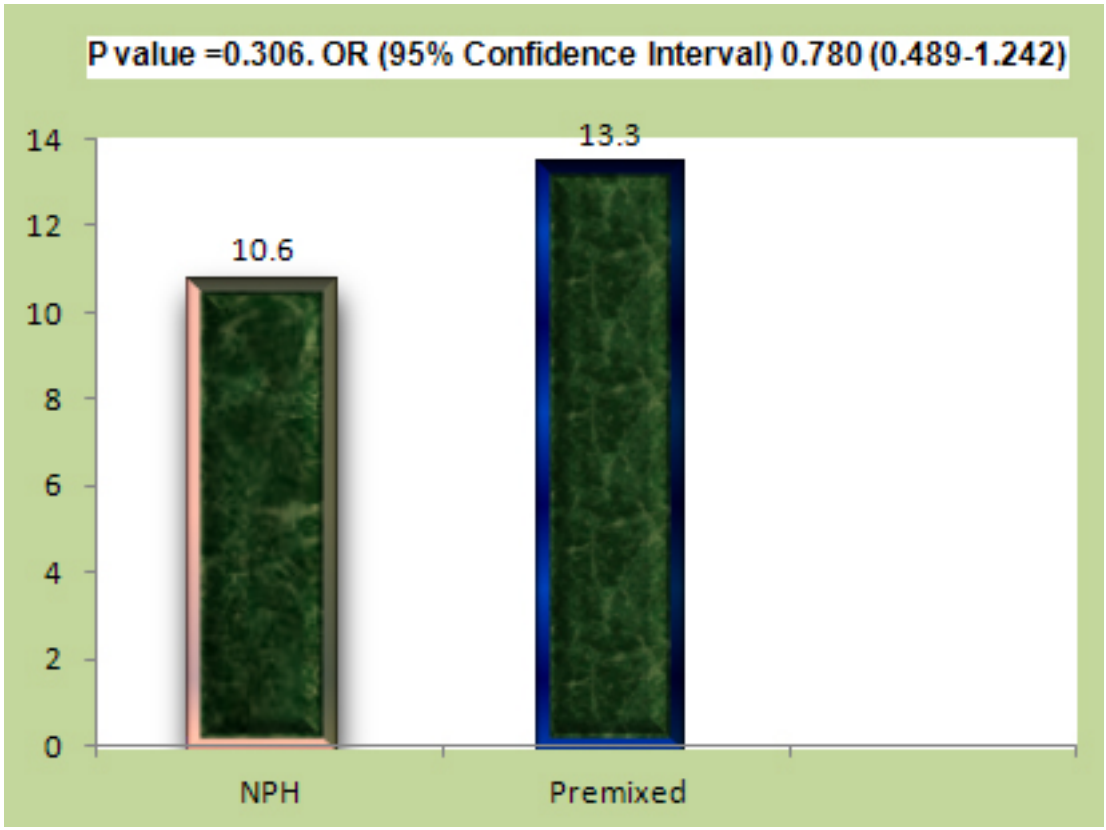

Figure 2: Target HbA1c (%) achieved at end of the study

The median time to start insulin in our study from the date of diagnosis, was 7 years. The median HbA1c before starting insulin was HbA1c 10.4 % and it dropped to 8.4 % by one year. In the UK, the median time from beginning treatment with the last oral agent to beginning insulin therapy is approximately 8 years. (12)

Our result was quite disappointing, like that of the 4T study where the first year results in 2007 showed that single basal analogue-insulin formulation added to metformin and sulfonylurea, resulted in a HbA1C level of 6.5% or less in a minority of patients at 1 year.(13) Furthermore after 3 years the insulin regimen was so complex, to achieve the target HbA1C. (14) These non-promising results were because type 2 diabetes is a progressive disease and no single regimen will succeed for more than 1 year and the main conclusion of the study at the end of 3 years was the addition of basal insulin to oral therapy, with subsequent intensification to a basal-bolus regimen as the preferred method of insulin initiation in people with Type 2 diabetes because the results of premixed analogues insulin was not impressive. (14)

Limitation

In our study, the decision to switch from OADs to NPH or premixed insulin treatment was not standardized but instead based on the judgment of the individual treating clinician.

Conclusion

This observational study suggests that in diabetic patients with failing OADs starting with NPH or premixed human insulin gives no significant difference in the outcome for at least one year.

Abbreviations

HbA1c: Glycated hemoglobin; OADs: oral antidiabetic drugs; NPH: Neutral Protamine Hagedorn

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The Role of B-scan ultrasonography in the pre-operative assessment of the posterior eye segment in patients with dense cataract

ABSTRACT

Aim: **to evaluate the incidence of posterior segment abnormalities in eyes with advanced cataract and to see whether eye ultrasound is essential before performing surgery.**

Method: **This is a prospective study conducted in Prince Rashed Hospital in Irbid, Jordan between August 2010 and April 2011. All patients with dense cataract preventing visualization of dilated fundus were enrolled in this study. Patients who had history of penetrating eye trauma or previous ocular surgery and patients with known previous posterior segment pathology were excluded from the study. 296 patients were included in our study. Detailed history regarding age, sex, smoking status, ocular history, past medical disease and trauma was initially obtained from all patients, then careful ophthalmic examination of the anterior segment was performed to all patients followed by B-scan ultrasonographic evaluation of the posterior eye segment.**

Results: **Abnormal eye ultrasound was present in 24.3% of patients; abnormalities detected were: posterior staphyloma (29.2%), vitreous hemorrhage (29.2%), retinal detachment (23.6%), asteroid hyolosis (16.7%) and choroidal tumor in (1.4%). Dividing the patients into traumatic (52 patients) and non-traumatic (244 patients) abnormal ultrasound was present in 15 (28.8%) and 57 (23.4%) of the patients respectively. The most common abnormality detected in traumatic cataract was retinal detachment (40%), while posterior staphyloma was the most common abnormality detected in non-traumatic cataract (33.3%).**

Conclusion: **Diabetes, hypertension and age younger than 52 years with eye trauma are associated with a high incidence of posterior segment abnormalities. It is recommended to use B-scan ultrasonography routinely for the detection of hidden posterior segment lesions pre-operatively in cataract patients; it may influence the surgical strategy and give ideas about postoperative visual prognosis.**

Keywords: **B-scan ultrasonography, cataract, posterior segment.**

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Introduction

Ophthalmic Ultrasonography consists of 8-10 MHz acoustic waves that are transmitted through ophthalmic structures. It was used for the first time in ophthalmology by Mundt and Hughes in 1956.(1) It has two types : A, a scan that is used to detect intraocular tumors and measure axial length of the eye and B, a scan which displays cross sectional views of lesions in the posterior segment, like vitreous hemorrhage, retinal detachment, intraocular foreign body, posterior vitreous detachment and tumors .(2) Ultrasonography is a valuable tool for evaluating the posterior segment in eyes with media opacification like: (Corneal opacity, hyphema, cataract) where direct visualization of the posterior eye segment is difficult .(3, 4) Cataract is one of the common causes of opaque media in which assessing structural changes in the posterior eye segment is limited without the use of ultrasound.(5) It is also considered one of the important causes of preventable blindness, affecting 12 to 15 million persons worldwide.(6) The aim of this study was to evaluate the incidence of posterior segment abnormalities in eyes with advanced cataract and to see whether eye ultrasound is essential before performing surgery.

Method

This is a prospective study conducted in Prince Rashed Hospital in Irbid, Jordan between August 2010 and April 2011. All patients with dense cataract preventing visualization of dilated fundus were enrolled in this study before scheduling them for cataract surgery. Patients who had a history of penetrating eye trauma or previous ocular surgery and patients with known previous posterior segment pathology were excluded from the study. 296 patients were included in our study. Detailed history regarding age, sex, smoking status, ocular history, past medical disease and trauma was initially obtained from all patients, and then careful ophthalmic examination of the anterior segment was performed to all patients followed by B-scan ultrasonographic evaluation of the posterior eye segment.

Results

296 patients were enrolled in this study; 161(58.3%) of them were males. Mean age was 52.3years (range 31-72 years). Abnormal eye ultrasound was present in 72(24.3%) patients. The abnormalities detected were distributed as follows: posterior staphyloma (29.2%), vitreous hemorrhage (29.2%), retinal detachment (23.6%), asteroid hyolosis (16.7%) and choroidal tumor was seen in one patient (1.4%). The results are summarized in Figure (1).

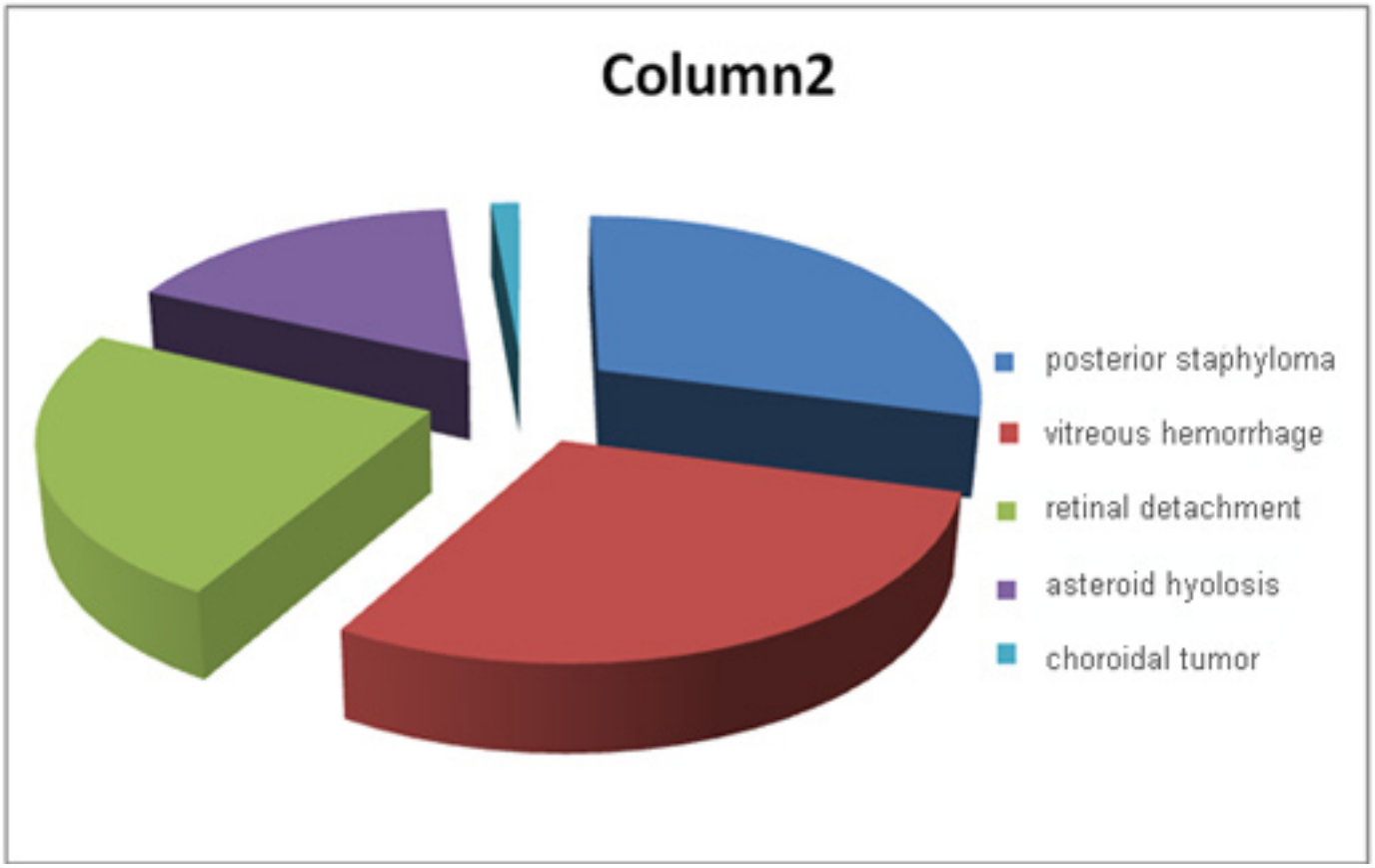

Figure 1

If we divided the patients in relation to history of trauma into traumatic (52 patients) and non-traumatic (244 patients), abnormal ultrasound was present in 15 (28.8%) and 57(23.4%) of the patients respectively. The most common abnormality detected in traumatic cataract was retinal detachment (40% of the lesions detected in eyes of traumatic cataract), while posterior staphyloma was the most common abnormality detected in non-traumatic cataract (33.3%). The distribution of the abnormalities among the two groups is summarized in Figure 2 - next page.

Regarding history and clinical examination, Table 1 - next page summarizes the positive findings.

Discussion

Jordan is considered one of the developing countries in which cataract is highly prevalent. The majority of patients in developing countries seek treatment of cataract when they have advanced drop of vision and dense cataract.(7) This limits proper assessment of the posterior segment prior to surgery, which is very important, to have an idea about the prognosis and the possible outcome of surgery and to refer the patient to a more advanced center if serious posterior segment lesion is detected. Under these circumstances ultrasonographic examination plays a role and can enable us to study the posterior segment.

Many studies have shown a significant incidence of posterior segment pathology in eyes with dense cataracts. (8) A recent study showed that the results of ultrasonography influenced the decision of surgical management in 7% of eyes with cataract.(9)

In our study we noticed that significant posterior segment abnormalities on ultrasonography occurred in 24.3% patients. This percentage is considered to be high if we compare it with other studies, for example Qureshi et al founded that posterior segment lesions were detected in 12% of patients with cataract.(10) This could be explained by age of the patients enrolled in their study which was 1-79 years compared to 31-72 years range in our study, where the prevalence of risk factors for posterior segment abnormalities is low. This all suggests that the prevalence of posterior segment lesions increases with age due to the increase in the prevalence of risk factors.

Posterior staphyloma and vitreous hemorrhage were the most common abnormality detected in all patients of 29.2% for each, while posterior staphyloma was the most common finding in some other studies.(11) Vitreous hemorrhage was not a common finding, unlike our study in which vitreous

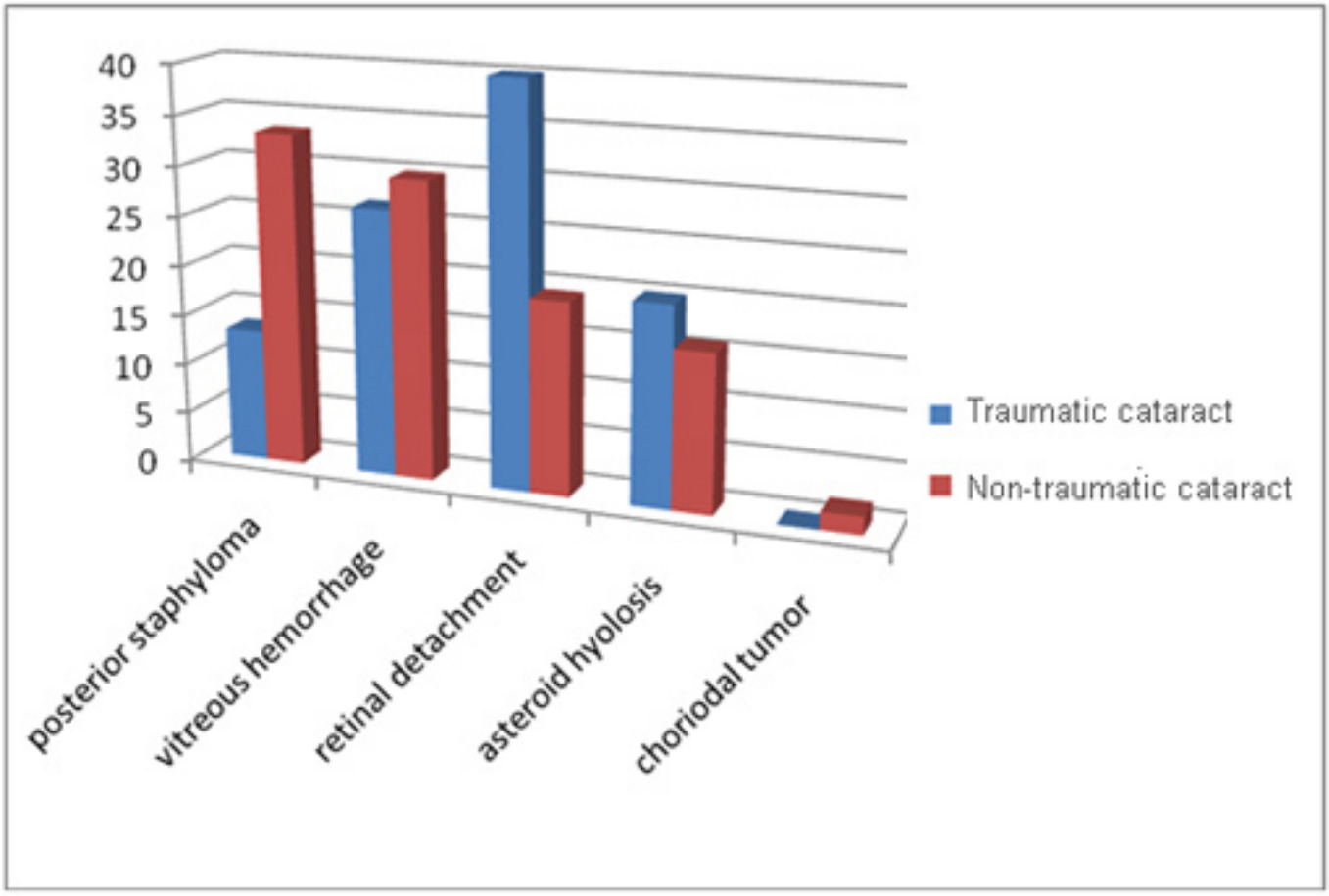

Figure 2

Finding in history and clinical examination	No. of patients	No. of Patients with abnormal ultrasound	The most common abnormality
Age < 52 years	143	32(22.4%)	Retinal detachment
Male gender	161	40(24.8%)	Posterior staphyloma
Diabetes mellitus	106	43(40.6%)	Vitreous hemorrhage
Hypertension	62	22(35.5%)	Vitreous hemorrhage
Smoking	114	27(23.7%)	Posterior staphyloma
Non penetrating trauma	52	15(28.8%)	Retinal detachment
Corneal opacity	4	1(25%)	Asteroid hyolosis
Keratic precipitates	2	0(0%)	----------
Posterior synechiae	3	1(33.3%)	Retinal detachment
Subluxated lens	4	1(25.0%)	Retinal detachment
Iridodialysis	2	1(50.0%)	Vitreous hemorrhage
Pseudoexfoliation	5	0(0%)	----------
Elevated intra ocular pressure	18	4(22.2%)	Vitreous hemorrhage

Table 1

hemorrhage was common. The explanation for this is that Jordan is considered one of the countries with a high prevalence of hypertension, diabetes and diabetic retinopathy due to ineffective screening measures.(12,13) The observation that 161 of patients enrolled in the study were diabetics and 40.6% of them had posterior segment abnormality supports the previous explanation in regard to hypertension; 62 patients were hypertensive and 22 (35.5%) of them had posterior segment abnormality. This all shows that diabetes and hypertension are risks for posterior segment abnormalities.

In regard to trauma, 28.8% of patients exposed to non-penetrating trauma had posterior segment pathology. This result is much lower than that performed by Qureshi et al who found the prevalence of posterior segment pathology in patients with eye trauma to be 49.3%(10). However patients with penetrating eye trauma were included in their study and this contributed to this high prevalence. The most common abnormality encountered in patients with non-penetrating trauma was retinal detachment. It is important that 80.8% of patients with trauma were younger than 52 years of age. This suggests that younger age is a risk factor for posterior segment abnormalities. In the eyes exposed to trauma, retinal detachment was the most common abnormality found.(14) Ali et al also found that retinal detachment was 3.3% in non traumatic cataract and 29.26% in traumatic cataract patients.(15) Smoking status and sex did not affect the prevalence of posterior segment abnormalities detected by ultrasound.

In regard to ocular examination, 38 patients had positive findings during examination and 8 of them had posterior segment abnormality by ultrasonography. History of trauma was found in 6 out of those 8 patients; no patients with Keratic precipitates and lens subluxation had posterior segment abnormality; one patient of the two patients with iridodialysis and 4 of 18 patients with Elevated intra ocular pressure had vitreous hemorrhage. One of the three patients with Posterior synechiae and one of the four patients with Subluxated lens had retinal detachment, but due to the low number of patients with anterior segment abnormalities it is difficult to assess whether anterior segment abnormalities is considered a risk for that of the posterior segment.

This study supported previous studies in regard to the importance of eye ultrasonography in the assessment of posterior segment prior to surgical intervention of cataract. It can affect the decision of surgery and it is an effective predictor of good postoperative visual results. This study also showed that patients with diabetes, hypertension and age younger than 52 years with eye trauma, are at risk for posterior segment abnormalities and so ultrasonography is essential in those patients before planning for cataract surgery if visualization of the posterior segment is limited.

Conclusion

Diabetes, hypertension and age younger than 52 years with eye trauma are associated with a high incidence of posterior segment abnormalities. We recommended to use B-scan ultrasonography routinely for the detection of hidden posterior segment lesions pre-operatively in cataract patients. It may influence the surgical strategy and gives an idea about postoperative visual prognosis.

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Significance of waist circumference in diabetes mellitus

ABSTRACT

Diabetes mellitus is one of the metabolic diseases which affect most parts of the body. Also it is a disease which may result from disturbances in some metabolic pathways, particularly the carbohydrate and lipid metabolic pathways. Much research has been conducted to explore the link between occurrence of diabetes and disturbed metabolic pathways and abnormal distribution of some tissues such as fatty tissues. The lipid metabolism pathway captures the attention of many researchers and a lot of studies have been done to explore its relation to diabetes mellitus.

In our mini review we try to answer if the waist circumference is of significance value in diabetes mellitus.

Key words: Diabetes mellitus, waist circumference

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Introduction

It is common in practice to ask if it necessitates a generalized or localized disturbance in the anatomy or physiology of the human body for diabetes mellitus to appear.

Let us keep in our mind that one of the important observations was the association of type 2 diabetes with weight increase.

One of the interesting ideas explains the previous observation is the accumulation of fat inside the body either at the level of cells or tissues and its impact on glucose homeostasis.

Digging deep on the previous idea, one can ask; is it the general or localized accumulation of fat which leads to disturbances in glucose homeostasis.

A considerable number of studies found strong correlation between abdominal obesity and diabetes.

The abdominal fat is localized in two compartments, the subcutaneous and the intraperotenal compartments. The subcutaneous fat is farther subdivided into the gluteofemoral and truncal subcutaneous fat. The latter is more related to the cardio metabolic risk factors (1).

Body adiposity measurement tools:

The Body Mass Index (BMI) is a measurement used to assess body adiposity. It is a result of dividing the body weight in kilogram by height squared in meters. The BMI reflects the situation of whole body and does not differentiate between localized or generalized obesity. The body mass index does not consider the individual variation in muscle mass or bone mass.

Abdominal obesity can be measured by using the waist circumference or the waist-hip circumference ratio.

Waist circumference is a measurement that provides an estimation of body girth at the level of abdomen. There is no consensus on the exact location for measuring waist circumference. Different sites have been mentioned in different papers (Box 1 - next page).

Waist circumference measurement technique:

Measurement should be taken while the subject is standing after exhalation. The subject should be standing without shoes and with both feet touching each other and arms hanging free. The tape should be made of material that is not easily stretched, such as fiberglass.

One of the interesting questions is which is the better; the waist circumference or the waist - hip circumference ratio to detect obesity related to the risk of developing diabetes?

Box 1: Anatomical landmarks for measurement of waist circumference

Midpoint between the lowest rib and the iliac crest
The umbilicus
Narrowest or widest waist circumference
Just below the lowest rib
Just above the iliac crest

In our opinion the waist circumference is the best. The gluteofemoral fat is considered when we measure the hip circumference and as we mentioned before the gluteofemral fat has no metabolic risk compared with the truncal or intraperotenal fat. So the hip circumference will not add to risk calculation. What is more, there are some studies that support the importance of the waist circumference as a better tool to predict abdominal obesity and the occurrence of diabetes and cardiovascular disease than other tools (2). Visscher TL et al found that among never smoking elderly men waist circumference may have more potential for detecting overweight than the BMI (3).

In 1997 an interesting prospective study published in the obesity research journal (4) looked for the best predictor of non insulin dependent diabetes mellitus (NIDDM) among different body mass measurements in Mexican Americans and reached the conclusion that waist circumference is the best obesity related predictor of NIDDM.

Yusuf S et al (5) in Lancet in 2005 discussed the issue of obesity and the risk of myocardial infarction in 27,000 participants from 52 countries in a case control study. They found that Waist-to-hip ratio and waist and hip circumferences were closely ($p<0.0001$) associated with risk of myocardial infarction even after adjustment for other risk factors.

Bigaard J et al (6) found in their study which was published in the International Journal of Obesity in 2005 that waist circumference was strongly associated with all-cause mortality after adjustment for body composition; the mortality RR was 1.36 (95% confidence intervals (CI): 1.22-1.52) times higher per 10% larger waist circumference among men and 1.30 (95% CI: 1.17-1.44) times higher among women. Adjustment for waist circumference eliminated the association between high values of the body fat mass index (BFMI) and all-cause mortality. The association between fat-free mass index (FFMI) and mortality remained unaltered.

What are the important health implications of waist circumference?

The importance of waist circumference in predicting cardiometabolic risk factors (hypertension, hyperglycemia and dyslipidemia) and adverse outcomes (diabetes, coronary heart disease and death rate) has been examined in many large epidemiologic studies.

Katzmarzy PT and Craiq CL (7) looked at the independent effect of WC and physical inactivity on the risk of mortality in women. They conducted a prospective cohort study which included 5421 females aged 20-69 years in the 1981 Canada Fitness survey. They concluded that physical inactivity and high WC have significant independent risks of premature mortality among women.

Also, Ingrid Lofgren et al (8) studied the postulation that waist circumference has a strong association with biomarkers of Coronary Heart Disease (CHD) than Body Mass Index (BMI). Their study included 80 overweight or obese premenopausal women. The results suggested that WC is a stronger predictive of CHD risk than BMI and is more closely associated with the level of exercise in premenopausal women.

Michael JB et al (9) concluded in their study published in the Obesity Journal that waist circumference by itself is a strong predictor of future glycemic control.

What is the relation between waist circumference and metabolic syndrome?

Hirschler V et al (10) in their paper published in the archive of pediatric and adolescence medicine found that Waist circumference is a predictor of metabolic syndrome in children and adolescents and could be included in clinical practice as a simple tool to help identify children at risk.

The presence of the metabolic syndrome will increase the risk for the cardiovascular disorders and other clinical conditions which may be associated with the syndrome (11). The syndrome also is considered as a pre-diabetic state. Patients who are not diabetic and diagnosed to have the syndrome are at high risk to develop type 2 diabetes (12).

What other features of the metabolic syndrome are relevant to abdominal obesity?

Abdominal obesity is a major component of the metabolic syndrome. The adipose tissue is working as an endocrinological unit secreting a lot of hormones and cytokines. The presence of this syndrome raised the risk of cardiovascular events among diabetics (11) (12). With the metabolic syndrome there are multiple changes occurring inside the human body.

The metabolic syndrome is a medical condition where there is a clustering of multiple factors.

One of the components of the metabolic syndrome is the pro-inflammatory condition. This condition is characterized by elevated cytokines (e.g. Tumor Necrosis Factor -Alpha & Interleukine-6) and acute phase reactants (C-Reactive Protein & Fibrinogen). A recent study suggests that immunity and inflammation play a role in the development of insulin resistance and predict the development of type 2 diabetes mellitus (13).

The other component is the prothrombotic state. This condition is characterized by elevations of Fibrinogen, Plasminogen Activator Inhibitor-1 (PAI-1) and possibly other coagulant factors. Reports showed that abdominal fat is more active in synthesis PAI-1 than other fat in the body (14). So, the increase in fat mass due to abdominal obesity will increase the amount of PAI-1 synthesized in the body. With the metabolic syndrome, activation of nuclear factor-kapa B (NF-KB) promotes synthesis of PAI-1, a normal inhibitor of tissue plasminogen activator and lead to impaired fibrinolysis. Plasminogen Activator Inhibitor levels correlate with plasma insulin levels and insulin resistance and appear to predict the likelihood of developing diabetes (14).

Conclusion

Waist circumference is a highly significant tool to predict abdominal obesity, cardiometabolic syndrome and glycemic control. We strongly recommend its implication on health practice.

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Impacts and effects of different kinds of Analgesics on duration of labour: A Retrospective Quantitative Outcome data

ABSTRACT

Background: Labour pain is a main distress to many parturients as the experience of pain is of extreme intensity and anxiety to many of them. It involves many aspects, for instance, cultural, ethnic, and psychosocial factors. It is important to educate such pregnant mothers about the physiology of labour, in order to alleviate their fears and worry. Pain management during labour still represents a challenge to the modern obstetric practice and needs more exploration and research.

Study Objectives: This study describes and addresses the most commonly used analgesics used during labour, and their impacts and associations with the safest outcomes in terms of the duration of labour and foetal complications.

Patients and Methods: The study involved 4,509 parturients undergoing labour at Birmingham Women's Hospital (BWH). The study design was non-experimental; a retrospective cohort collected through tracing the patients' records from the archives of Birmingham Women's Hospital, for women who had delivered vaginally at the hospital during the period time from January to December 1995. The inclusion criteria for this study were the mean age of mothers being around 27 years, and all were British. All of the mothers who had delivered at the hospital, and lived within the catchment area of Birmingham Women's Hospital. There are however many variables in this data set, and in order to achieve the aims and objectives, only some of the variables were used for the statistical analysis. These variables were the length of the three different stages of labour in relation to the usage of analgesia-1, the incidence of foetal heart rate abnormality (FHR), the presence of meconium in the amniotic fluid, admission to the neonatal unit, 'one' and 'five' minute Apgar score, and lastly the episiotomy incidence. Consent and ethics approval were taken before commencing the study from the allocated Coventry University HIRI Ethics committee. The analysis was carried out using SPSS version 12.

Results: Entonox was associated with the shortest duration of labour stage-1 (6 hours), and stage-2 (25 minutes), compared to the Epidural analgesia, which was associated with longer labour, $p<0.05$ and with some complications for the mother and the foetus, $p<0.05$. Pethidine was associated with a lower APGAR score at 5-minutes (below 7).

Conclusions: The overall conclusion; Entonox seems to provide the safest method of analgesia and is associated with the shortest labour compared to the other studied analgesic protocols. Therefore this will encourage the clinicians to apply it safely during labour.

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Introduction

'Labour still is always excruciating', is probably one of the oldest myths, and is present in all cultures(1,2). When labour was actually studied, only about 20% of women said labour was horrible or excruciating. And another 20% said they had low levels of pain(3). The rest of the labours were somewhere in the middle(3,4). Physical indicators that a woman would feel more pain with labour include a history of miscarriage(5,6), or abortion, and menstrual(7) problems(8-12). Emotional indictors include difficulty accepting pregnancy, conflict about becoming a mother, being anxious about labour, unstable emotional feelings and a previous psychological issue requiring counseling(13-15). Social indicators include less education, younger age, first time mother and a partner who is negative or indifferent toward pregnancy (16).

Labour pain, regardless of the cause, represents a major concern to the modern health care practice (17-19). Despite the significant progress in pain management, most parturients still experience significant pain during Labour(20-22). The good thing about labour pain is that although it is more intense than most other pain complaints, it has a positive outcome (23). Pregnancy is a state of immune-suppression(15,18,24), probably due to progesterone(25), which inhibits production of interleukin-8 (IL8), and therefore maintains pregnancy until term(15,20). At parturition progesterone declines, so interleukin-8 increases and initiates cervical ripening in order to initiate the process of delivery(18). Many confounding factors, such as parity, ethnic and cultural factors are involved in the process of delivery, on top of physiological, psychosocial and environmental factors (8,26). Psychological factors, in particular, have an important role in the appreciation of pain (13,26). However, confidence and support can alleviate the fear of pain in labour (8, 25,27,28). It has been shown that during labour, the level of -endorphin increases dramatically, and it is directly related to the intensity as well as the number of uterine contractions (12,15,20). This seems to contribute to the mechanism of endogenous analgesia during labour (20,28). Despite the intensive research about labour pain and the availability of different reliable protocols, there is no consensus yet about pain management during labour(29,30), and therefore the appropriate management of labour pain is still a difficult issue(30).

Aims and Objectives

The aim of the present study was to analyse a retrospective-collected data set on pain-relieving protocols used in labour in terms of duration and safety of labour in the UK.

Patients and Methods

The study on acute labour pain involved 4,509 subjects undergoing labour at Birmingham Women's Hospital. Data for all women who gave birth at Birmingham Women's Hospital (BWH) during the period between January and December 1995 were analysed retrospectively after receiving the consent from the patients in acute labour, and the ethical approval from the assigned Coventry University HIRI Ethics committee. The study design was non-experimental; a retrospective cohort collected through the patients' record from the documentations of Birmingham Women's Hospital, for women who had delivered vaginally at the hospital during the time period from January to December 1995. The inclusion criteria for this study were the mean age of mothers being around 27 years, being a British mother living within the BWH catchment's region and received one type of anaesthesia during labour. Data were not recorded for women who received no analgesia during labour. The analysis covered all pregnant women delivered by normal vaginal delivery during the mentioned period. The analgesic protocols used in BWH were namely; Trans-electrical nerve stimulation (TENS), Entonox, Pethidine, Epidural analgesia, Spinal anaesthesia, Pudendal block and General anaesthesia. Analgesia-1 was used for the analysis for each of the three different stages of labour and in order to make the study amenable to the defined objectives we used restricted variables for the statistical analysis; namely: the duration of the three different stages of labour in relation to the usage of analgesia-1, the incidence of foetal heart rate abnormality, the presence of meconium in the amniotic fluid, newborns' admissions to the neonatal unit, one- and five-minute APGAR score, and lastly the Episiotomy incidence. All these variables were recorded and evaluated. The statistical software (SPSS version 12) "Statistical Package for the Social Sciences" was used for the analysis. The length of stage-1, 2 and 3 of labour was plotted against the different types of analgesia used in labour. A filter was applied in order to remove erroneous values. One-way ANOVA test was used to conclude the overall significant difference between different analgesics and the length of each of the three labour stages. Post hoc test was utilized to compare the effects of different analgesics with each other in terms of the duration of the three labour stages. Cross-tabs test was applied to explore the relationship between usage of different analgesia and the incidence of foetal heart rate abnormality.

Results

1) Use of different analgesics in labour:

Initially the integrity of the data was checked. SPSS was used to explore the data and some invalid values were found. So, a filter was applied to remove these values. This was applied to all relevant data for the three stages of labour. (See Table 1 - next page).

2) Analgesia Protocols:

Table 1 shows percentages and numbers of patients received different types of analgesia in each stage of the three stages of labour. Entonox was predominantly the most widely used analgesic in each stage, followed by Epidural, TENS and pethidine, p=0.0001. Spinal anaesthesia, general anaethesia and Pudendal block were used in very small number of patients, which was not up to statistical evaluation, but we kept their records.

3) The Duration of Stage-1 labour:

The mean length of stage-1 of labour in all studied patients was 6.996 hours, and the median was 6.1667 hours, S.D (degree of variation among observation in the sample studied) was 4.08860 hours. The minimum and maximum mean lengths recorded in hours, and it was for stage-1 labour between 0.08 and 19.92 hours. The distribution however was skewed; therefore most data were described using median plus inter-quartile range. The distribution was negatively skewed. In other words it is skewed to the lower end.

One-way ANOVA test showed that there was an overall significant difference between the effects of the various used analgesics on the length of stage-1. Post hoc test showed that TENS had significantly longer stage-1 than Entonox (p=0.0001) and Pethidine (p=0.014). Entonox had significantly shorter stage-1 labour than TENS (p=0.0001), Pethidine (p=0.025) and Epidural (p=0.001) respectively. Pethidine had significantly shorter stage-1 labour than TENS (p=0.014), but greater than Entonox (p=0.025). Epidural had significantly longer stage-1 labour than Entonox (p=0.0001), Figure 1.1 - next page.

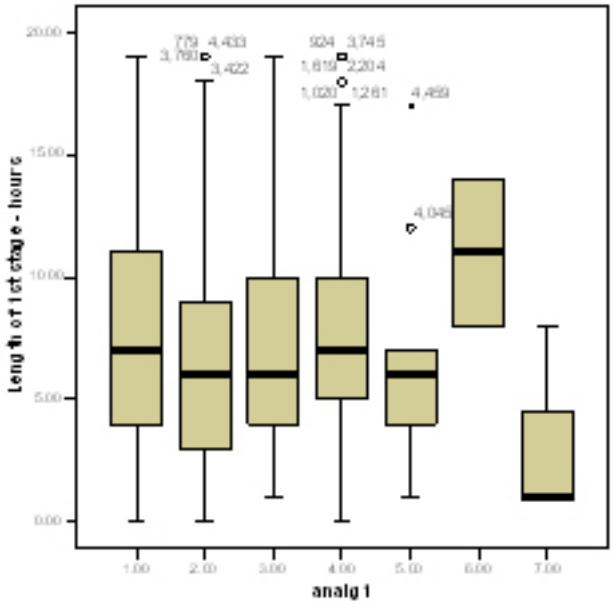
4) The Duration of Stage-2 labour:

The mean length of stage-2 of labour in all patients was 0.8473 hours, and the median was 0.4333 hour, S.D was 0.92840 hours, and the minimum and maximum durations 0.02 and 3.98 hours respectively. The skewness was 1.402, and the kurtosis was 1.038. The distribution was skewed to the lower values. The median lies at 0.4 hour and there was a large number of outliers.

In a similar pattern to stage-1, one-way ANOVA test showed that there was an overall significant difference between the effects of the various used analgesics on the length of stage-2. Post hoc test showed that TENS had significantly longer stage-2 duration than Entonox (p=0.0001) and Pethidine (p=0.023), while significantly shorter than Epidural (p=0.0001). Entonox had significantly shorter stage-2 duration than TENS (p=0.0001), Pethidine (p=0.0001) and Epidural (p=0.0001). Pethidine had significantly shorter stage-2 duration than TENS (p=0.023), Entonox (p=0.0001) and Epidural (p=0.0001). Epidural had significantly longer stage-2 duration than TENS (p=0.0001), Entonox (p=0.0001), Pethidine (p=0.0001), and Spinal Anaesthesia (p=0.016). Spinal Anaesthesia had significantly shorter stage-2 duration than Epidural (p=0.016), Figure 1.2.

Analgesia	Stage 1 Labour	Stage 2 Labour	Stage 3 Labour
	% (number)	% (number)	% (number)
TENS	% (426)		
Entonox	% (2686)		
Pethidine	% (230)	120	
Epidural	% (469)	121	
Spinal Anaesthesia	% (9)	210	
Pudendal Block	% (2)	20	
General Anaesthesia	% (3)	53	
Total	**3825**		

Table 1: Analgesia used in Stage 1 labour



Code key: 1=TENS, 2= Entonox, 3= Pethidine, 4= Epidural, 5=Spinal Anesthesia, 6= Pudendal Block, 7= General Anasthesia.

Figure 1.1: Length of Stage 1, 2, and 3 Labour (in hours) in different analgesia protocols

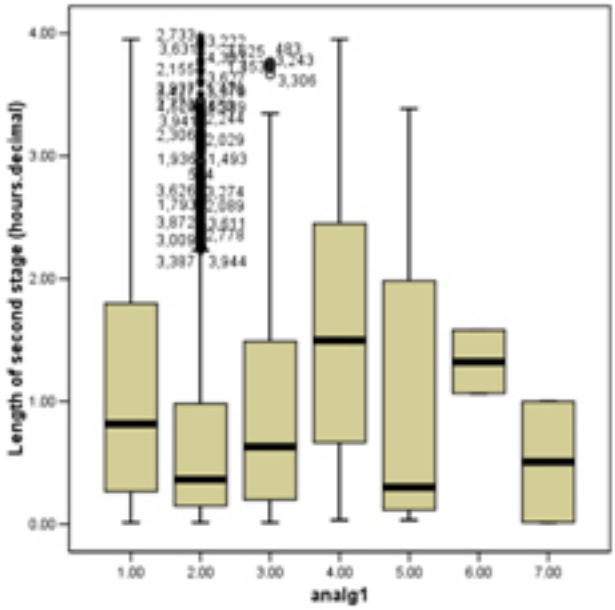


Figure 1.2

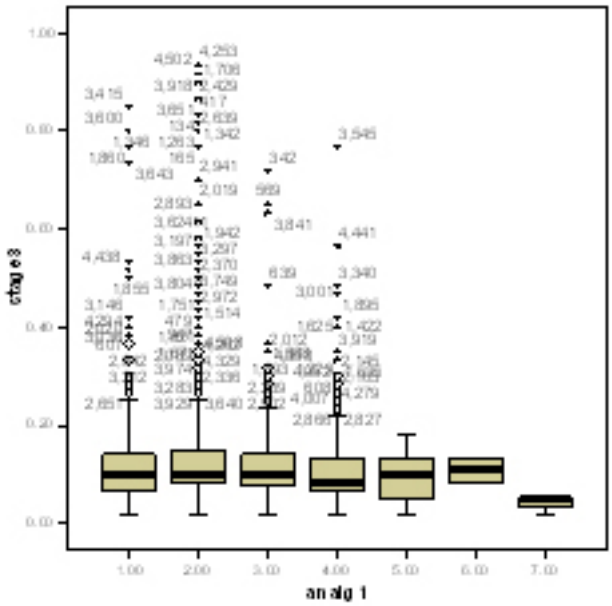


Figure 1.3

Analgesia	Stage 1 Labour	Stage 2 Labour	Stage 3 Labour
	% (hours)	% (hours)	% (hours)
TENS	% (426)		
Entonox	% (2686)		
Pethidine	% (230)	120	
Epidural	% (469)	121	
Spinal Anesthesia	% (9)	210	
Pudendal Block	% (2)	20	
General Anaesthesia	% (3)	53	
Total	**3825**		

Table 2: The effects of analgesia protocols on the length labour stages 1, 2 and 3

5) The Duration of Stage-3 labour:

The mean length of stage-3 in all patients was 0.1217 hour, the median was 0.1 hour, S.D was 0.09199 hour, and the minimum and maximum duration were 0.02 and 0.93 hours respectively. The skewness was 3.687, and the kurtosis was 20.636, which were quite high. The distribution was almost bell shaped. The median value was at 0.1 hour, and similar to stage-1 and 2, there were a large number of outliers.

Unlike Stages-1 and 2, one-way ANOVA test showed that there were no significant differences between the lengths of stage-3 using different types of analgesia. The duration of stage-3 labour using the different types of anaesthesia lay within 0.1 hour (6 minutes). Post Hoc test had however shown that Entonox had a significantly longer stage-3 duration than Epidural (p=0.0064), Figure 1.3.

6) Fetal Heart Rate Abnormality (FHRA):

Spinal Anesthesia was not associated with any heart abnormality; pethidine was associated with 26.5%, (n=62), TENS was associated with 27.4%, n=124), Entonox was associated with 28.75% (n=686), Epidural was associated with 38.6% (n=188), Pudendal Block was associated with 50% (n=1), and General Anaesthesia was associated with 50% (n=1), Table-2. Chi-Square test confirmed that there was a statistical significant relationship between the type of analgesia and the incidence of FHR abnormality. However, the high percentages of foetal heart abnormalities recorded with the use of Pudendal Block and General Anaesthesia is not conclusive due to the low number of patients in each of these groups.

7) Meconium in the amniotic fluid:

Cross-tabs and Chi-square tests showed that there was no overall significant relationship between the usage of analgesia and the presence of meconium in the amniotic fluid.

8) The Newborn admission to neonatal unit:

Cross-tabs and Chi-square tests showed that there was no overall significant relationship between the usage of analgesia and the admissions of newborns babies to the neonatal units.

9) One-minute APGAR score:

Most of the new born babies were scored 9 for one minute APGAR score. Neither Chi-square nor ANOVA test showed

any significant difference between the various analgesia protocols on one minute APGAR score. Only Pudendal Block showed a lower score of 7, Figure-2. The number of outliers with lower APGAR 1 was quite high as can be seen from the box plot Figure-2. A Post hoc test showed that there was significant difference between analgesia Entonox and Pethidine, p=0.038 3 and Spinal Anesthesia, p=0.035 for one minute APGAR score.

10) Five-minute APGAR score:

Most babies scored 9 and 10 for 5 minute APGAR score. In TENS (312 scored 9, 127 scored 10), in Entonox (1725 scored 9 and 923 scored 10), in Pethidine (179 scored 9 and 52 scored 10) and in Epidural as (334 scored 9 and 55 scored 10). Chi-square showed a significant relationship between the 5-minute APGAR score and the type of analgesia used. Figure-3 shows that Pethidine had a narrower spread of APGAR score 5, and the median value appeared to be slightly lower than that of the other applied analgesics. The post hoc test showed that there was a significant difference between Apgar score at 5 minutes and different analgesics used. Entonox, Epidural and Spinal Anesthesia had a significantly greater APGAR score 5, p=0.034. On the other hand, analgesics TENS, Pethidine and General Anaesthesia had a significantly lower APGAR score 5, p=0.023. TENS, Pethidine and General Anaesthesia all had a significantly greater APGAR score 5 than that with Entonox, p=0.035, whereas, for Pethidine it was different, as Entonox and Epidural are significantly lower APGAR score 5 than Pethidine, p=0.023. Both analgesics Pethidine and General Anaesthesia had significantly higher APGAR score 5 than Epidural, p=0.03. General Anaesthesia had a significantly greater APGAR 5 score than that of Spinal Anesthesia, 0.013 TENS, p=0.034 Entonox, p=0.03 and Epidural, p=0.023 Spinal Anesthesia had significantly lower APGAR score 5 than that with General Anaesthesia, p=0.035.

11) Episiotomy:

The rate of Episiotomy was highest with Pudendal Block (50%, n=1), followed by Epidural (35.25%, n=177), followed by TENS (29.95%, n=139), followed by Pethidine 24% (n=59), followed by Spinal Anesthesia 20% (n=2), and the lowest rate was in Entonox (18.5%, n=521) and General Anaesthesia, which was associated with any Episiotomy, Table-4. Chi-square showed a significant relationship between the type of used analgesia and the rate of Episiotomy, p=0.023.

Discussion

Surveys on acute pain management showed a preference for Entonox analgesia among pregnant women in the UK for the three different stages of labour, followed by epidural analgesia. In this study, Entonox statistically showed a reduction of both stage-1 and stage-2 labour duration. This reduction in the duration of labour has not been reported in any previous study. This should be confirmed in future research works; as the inhalation of nitrous oxide can safely provide an effective as well as acceptable form of analgesia during labour, and also has an easy method of application. However, in one previous study, Entonox was associated with a reduction in uterine activity in the late first stage with poor analgesia; a complication that if it happened, might subsequently prolong the duration of labour(24), but there is no clear explanation how Entonox might cause a reduction in uterine activity, and no proof that this has resulted from Entonox. In our study, this deleterious effect was not demonstrated. Entonox has a quick elimination from the bodies of both the mother and the foetus, which makes it safe to use(4). Also in our study Pethidine, on the other hand showed a shorter stage-1 labour, but a slightly prolonged stage-2 labour in comparison with Entonox. Prolongation of overall labour duration is consistent with the literature. on the other hand Opioids have lost their popularity as an effective means of analgesia, and their use became a controversial issue although they provide good pain relief measures during labour(16). Side-effects of pethidine can be explained due to its property of crossing the placenta, and this will lead to neonatal respiratory depression, inhibition of alertness, inhibition of suckling and feeding, and lower neuro-behavioural scores(1), all of which may be responsible for the

Anaesthesia Type	1	2	3	4	5	6	7
Rates %	27.43	28.66	26.49	38.60	0	50	50

1=TENS, 2= Analgesics Code: 1=TENS, 2= Entonox, 3= Pethidine, 4= Epidural, 5=Spinal Anesthesia, 6= Pudendal Block, 7= General Anaesthesia

Table 3: Rates of incidence of fetal heart abnormality

	1	2	3	4	5	6	7
Rates %	29.95	18.50	24.081	35.25	20	50	0

1=TENS, 2= Analgesics Code: 1=TENS, 2= Entonox, 3= Pethidine, 4= Epidural, 5=Spinal Anesthesia, 6= Pudendal Block, 7= General Anaesthesia

Table 4: Rates of episiotomy

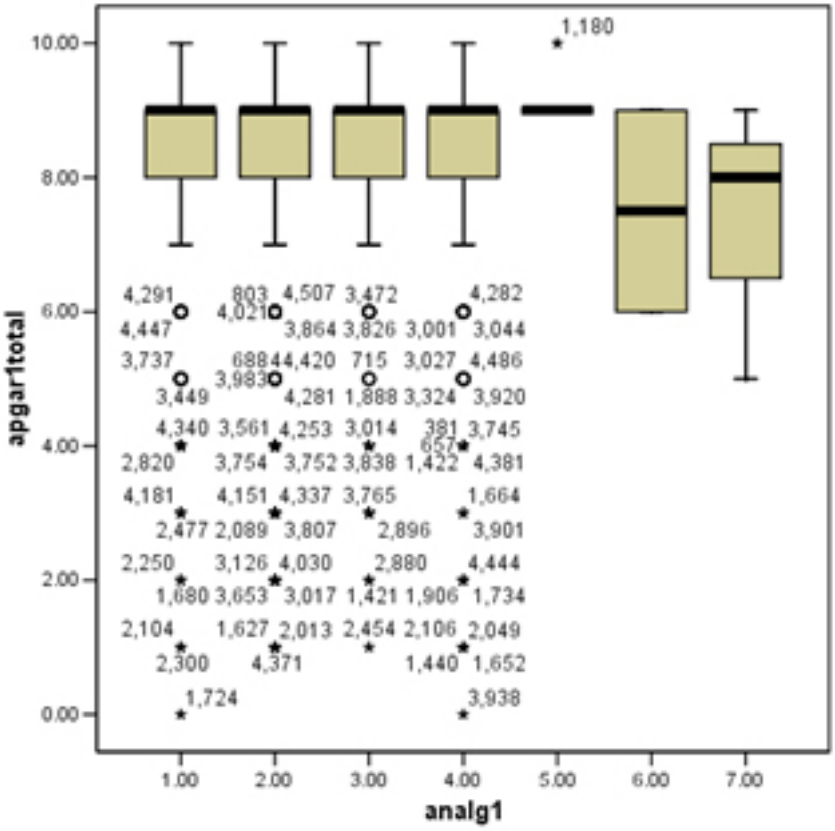


Figure 2: Effects of the different analgesia on APGAR-1

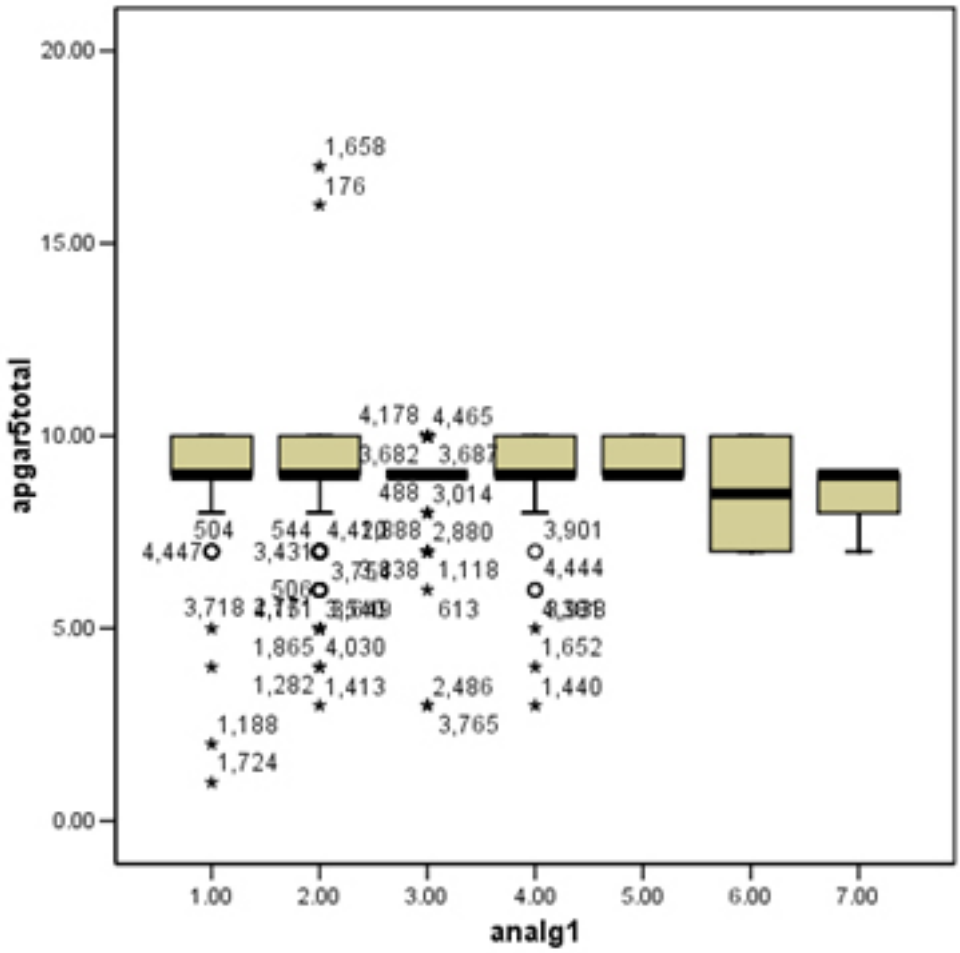


Figure 3: Effects of the different analgesia on APGAR-5

decline in its popularity. Meanwhile it is nowadays replaced by the Epidural analgesia. Epidural analgesia in the study was associated with prolonged labour, and some side-effects such as higher incidences of episiotomy, which is consistent with Leighton's work (6, 12). The prolonged duration of labour with Epidural analgesia can be explained by its possible relaxant effect on the uterus by inhibiting the motor nerve supply, thus causing foetal head mal-position(19), which leads eventually to either prolonged or obstructed labour. The consequences can be either augmentation of labour by oxytocin, or caesarian section. Though some articles agree strongly with this(21, 17, 6), others deny any associations(12). TENS in the study resulted in unexpectedly prolonged stage-1 and 2 labour. TENS was either associated with a shorter duration of labour and no maternal or foetal adverse as Tischendorf demonstrated(22, 10), or as shown by Lee et al, had no effect at all(11). Another study claimed that TENS was not an effective means of pain relief in labour(23). In this study TENS was associated with a higher incidence of FHR abnormality, high incidence of meconium in liquor, high incidence of admission to the neonatal unit, and higher incidence of Episiotomy. The prolongation of labour in this study can be explained by the mechanism of action. TENS stimulates nerve endings causing -endorphin release which could have a negative effect on labour by relaxing the uterus, and also by inhibiting the production of some key pro-inflammatory mediators; such as interleukin-8, which would slow down labour(15). This prolongation could subsequently cause foetal complications.

The other analgesics such as spinal anaesthesia, pudendal block, and general anaesthesia showed various effects. For instance, spinal analgesia had been associated with a short duration of labour, though it is not that commonly used in the UK, and the N number was low, and therefore the findings cannot be taken into consideration for analysis in this study. Also, pudendal block and general anaesthesia were associated with prolonged labour, but the number of cases (N) who were treated with these protocols were too low and therefore, their analysis was not considered in this study. There is very little information in the literature referring to stage-3. In this study, a significantly shorter stage-3 was seen with Epidural compared with Entonox. This could possibly be explained due to the mechanical intervention associated with Epidural analgesia in comparison with Entonox, which involves a more natural delivery. In fact, Epidural analgesia is usually applied in complicated labour rather than in a normal labour. The non-continuous variables were correlated with each applied analgesic, and the results were as follows: the incidence of foetal heart rate abnormality was greater with epidural analgesia. This could be related to the mechanism of action of Epidural analgesia. After the injection of Epidural analgesic, maternal hypotension may occur, and also the analgesic can cross the placenta and cause transient foetal heart rate changes(2). A higher incidence of meconium in the amniotic fluid was seen with Epidural analgesia, which could also be related to the placenta crossing feature, and the foetus distress that may result. However, Epidurals are more used in complicated labours, which could precipitate foetal side-effects. The prolongation of labour associated with Epidural may also play an important role in causing foetal heart abnormalities. Pethidine in this study was associated with a lower incidence of meconium occurrence, and also with lower incidences of Episiotomy, which cannot be explained and might need a further study to explore this results. Entonox and Pethidine were associated with low incidences of admissions to a neonatal unit, while higher incidence was seen with TENS and Epidural. This associated prolonged labour with these analgesics may be responsible for this.

Higher median Apgar scores at 1-minute (9) post-partum were associated with Entonox, TENS, Pethidine and Epidural analgesia. In the literature, this high Apgar score is documented in some studies, as for example in the case of Entonox it is rapidly eliminated, hence there is no negative effects on the Apgar score in general(4). In the case of Epidural analgesia, the Apgar scores were high, and this is consistent with the literature(12). Some studies on TENS reported that the Apgar score is not affected(22, 10). The effects of Pethidine on the Apgar score were more apparent at 5-minutes compared to 1-minute post-delivery. This could be due to the longer time period for the drug to affect the foetus after delivery. There was a narrower spread of data for the Apgar score at 5-minutes post-delivery with Pethidine. The change in Apgar score shows recovery of some low scores at 1-minute to about 9 at 5-minutes. There is a reversal effect of the antagonist Naloxone which should be given after birth to all those babies whose mothers received Pethidine during labour. The 5-minute Apgar score is a more reliable measure, because the foetus may have recovered from the stress of labour. In this study, a higher median Apgar score at 5-minutes post-partum was associated with Entonox, TENS and Epidural analgesia, while lower scores were seen with Pethidine, with a narrower spread of Apgar scores, which is consistent with the literature(3). It is possible that neonates of mothers who received Pethidine showed a lower Apgar scoring at 5-minutes due to the effect of respiratory depression on the baby's breathing, and if the labour was prolonged, there would be time for the Pethidine effects to fully take place, and thus effects might appear clearly within 5-minutes.

Conclusions

In conclusion, attitudes towards pain relief in labour have changed over time. This research study supports the notion that Entonox seems to be the safest analgesia, which carried minimal hazards in the various selected variables for analysis. Epidural analgesia, however, has become more popular as it is associated with the highest levels of pain relief satisfaction, while opioid use has declined progressively. The main problem with Opioids is the prolongation of stage-1 and stage 2 labour, which has continuously raised some concerns. Still, connected with this trend is an increase in the number of women who want to deliver their child in as natural way as possible, without any analgesia. There is an increasing and statistically significant tendency for women to undergo labour without any analgesic assistance. This can be attributed to more physiological approaches to pain relief during labour. They do not want to be deprived of the feelings of the birth process.

Modern analgesia aims to produce pain relief without any compromise of the motor function and the ability to push in the second stage of labour. This possibility can be achieved using low doses of local anaesthetics (Bupivacaine for example) with Opioids via the Epidural route - a mobile Epidural.

More research is needed to allow the development of safe regional analgesia without any hazards to the mother. Analgesia should be tailored and individualized to the patient and the situation. Currently, Entonox is the most popular form of analgesia in labour in the UK. Some literature shows that women feel nervous and even guilty about using an Epidural, even when they are satisfied with the pain relief. However, improved patient education can alleviate such fears. It is ideal however for labour pain relief that is safe for both mother and baby, and it should not affect the progress of labour. Complete pain relief is not always desirable as some women still accept the myth stating removing labour pain allows for a better live birth experience. When this was assessed, women who rate their birth experiences the best are not the women who had the least painful births. In fact, women who used Epidural pain relief have less positive feelings about their birth experience than women who use no medical pain relief. Low levels of pain have not been found to be associated with high levels of enjoyment during labour. Feeling in control of the decisions being made is more important to a good birth experience than having less pain.

The relief of pain in childbirth requires an approach that is calculated to meet the demands of each mother individually. Therefore, safety and acceptability will ensure which analgesics continue to be used.

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The Cost Analysis of Different Types of Cancer Treatments and its Effect on Household Expenditure

ABSTRACT

Increased numbers of Cancer cases in Bangladesh not only puts a burden on the health care budget of the country but also puts extra burden on the households of the Cancer patients. So the overall objective of this study was to assess the treatment cost of cancer patients and its effect on household expenditure. Number of respondents selected was 301 with different types of cancer and treatments such as Radiotherapy, Chemotherapy and both Radiotherapy and Chemotherapy. Male: Female was 141:160. The mean household income of the respondents who had taken radiotherapy, chemotherapy or both radiotherapy and chemotherapy were 10953.97 taka, 9852.11 taka and 44100.00 taka respectively. The mean Household expenditure on food for Radio, Chemo or both radiotherapy and chemotherapy patients was 5427.78 taka, 4788.73 taka and 6855.77 taka respectively which varied significantly. For the respondents who had radiotherapy, the mean Physicians' payment, hospital staying costs and other costs including investigation, surgery and medicine were 3073.65 taka, 9173.41 taka, and 30785.71 taka respectively. For Chemotherapy patients the same types of costs were 2625.92 taka, 8815.56 taka and 21676.06 taka respectively. In addition, for those who had both radiotherapy and chemotherapy the costs were 6591.25 taka, 15890.38 taka and taka 49298.08 which varied significantly by types of treatment. In this study a positive relationship was found between the types of treatment and the expenditure of food and transport costs. The costs of the treatment were much higher than the national standard of the household expenditure on medical care. For the patients who had Radiotherapy the mean cost of lost assets, earning wage loss and the total amount of loans were 20214.29 taka, 29160.00 taka, and 33217.46 taka respectively. The same scenario was found in the patients of chemotherapy and both groups.

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Background

Cancer is the second biggest killer following cardiovascular disease. In the year 2005, Cancer killed 7.6 million people worldwide; three quarters of whom were in low- and middle- income countries. By 2015, that number is expected to rise to 9 million and increase further to 11.5 million in 2030.(1) The Estimated age standardized rates of cancer patients in this SEAR region are; males 99.0 to 129.6 per 100,000 and 104.4 to 154.3 per 100,000 in females.(2) Incidence of Cancer increased in Bangladesh for the last two-three decades. No reliable statistical data is available for most developing countries in general, and Bangladesh in particular. In the light of the statistics available from the World Health Organization, cancer incidence, prevalence and mortality can be estimated approximately as 2,00,000, 8,00,000 and 1,50,000 respectively for the 130 million people of Bangladesh. Based on the World Health Statistics, new cancer cases in Bangladesh have been estimated at 167 per 100,000 population.(2&3)

The economic impact of cancer goes beyond the costs to health services. The resource allocation is not adequate for the treatment of cancer patients. The different treatment modalities are required, like surgery, chemotherapy, radiotherapy, and hormone therapy in combination or alone. The terminal care or palliative care costs are also high. The cost to the patient includes direct and indirect costs. Direct costs of cancer treatment include diagnosis cost, number of Physician's visit and total costs of Physicians visits, diagnosis cost, treatment costs which comprise surgery, radiotherapy,

chemotherapy or combinations of any. Other direct costs include cost of medicine, hospital staying cost and transport cost, home care. Household expenditures include food expenditure, non food expenditure including cost of education of the household members, house rent, opportunity costs. The indirect costs of the Cancer patients include wage loss, unemployment, loss of household assets etc. The objective of this study was to estimate the different types of cost of cancer treatment including direct and indirect costs along with household expenditure of food items and non food items of the cancer patients.

Methods and Materials

A cross sectional study design was conducted to observe the cost of the different types of cancer treatment, and household expenditure of cancer treatment groups following treatment.

The duration of the study period was of 1 year (July, 2009 -June, 2010). Data collection period was from September, 2009-February, 2010. The study population included all the patients meeting the inclusion criteria attending during the time of the data collection period in the Radiotherapy Department of Dhaka Medical College. Diagnosed Patients who completed their current treatment of radiotherapy, chemotherapy or had combined radiotherapy and chemotherapy, of any age irrespective of sex and tumor sites ,and who agreed to participate. The study also included parents or attendants of minor and handicapped patients. Data was collected by semi structured questionnaire. There was face to face interview with semi structured questionnaire.

Data was analyzed by statistical software SPSS 11.5. After taking the approval of BIRDEM ethical committee, data was collected from the respondents after taking informed consent. Confidentiality of the data was also maintained.

Results

Out of 301 respondents the mean age of the respondents was 48.94 years (±15.47) among which 46.8% were male and 53.2% were female. 92% were the followers of Islam, 7.6% were the followers of Hinduism and 0.3% were Buddhists. The majority of patients were married (96.7%) and major respondents among them were housewife 129 (42.9%); others include service holder 64 (21.3%), farmer 48 (15.9%), day laborer 25 (8.3%), businessman 20 (6.6%), student 9 (3%) and others 6 (2%). The mean numbers of household members were 5.62 (± 2.45). Mean dependent household members were 1.78. The respondents of the study were almost equal whether they possessed land or not. The respondents who had possession of land and house were 50.2% and 87.7% respectively.

The Household incomes in the majority of the respondents (39.9%) were between 5001-10000 taka. The average Household income was 22146.51 taka (SD±12746.57). The average Household expenditure on food was 5770.43 taka (SD±3956.32). 31.6% respondents have no expenditure on education in household. Among the respondents the majority (83.1%) who resided in their own home had no expenditure on house rents. The highest transport cost of the household of the respondents i.e. 62.5% was equal to or below 1000 taka. (Average transport costs 1396.18 taka and SD± 1061.81).

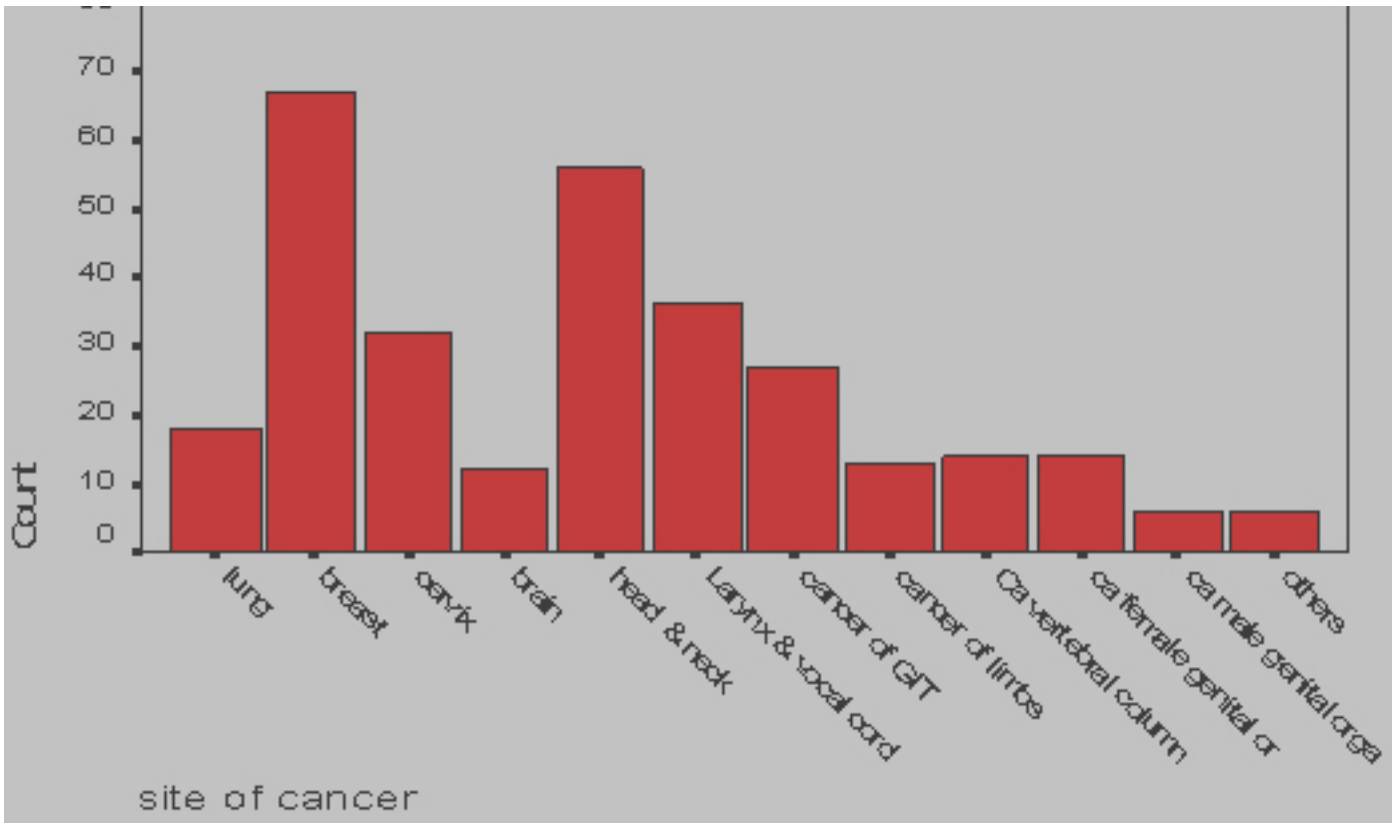

Figure 1: Types of cancer among the participants

Radiotherapy related cost		Frequency	Percent	
Cost of radiotherapy (TK)	≤2000	29	23.0	Mean= 5251.48 taka SD= ± 4528.58
	2001-4000	19	15.1	
	4001-6000	48	38.1	
	6001-8000	17	13.5	
	8001-10000	6	4.8	
	>10000	7	5.6	
Average daily cost of travel & food	100-<500	97	77.0	Mean= 458.88 taka SD= ± 298.24
	500-<1000	16	12.7	
	1000-above	13	10.3	
Opportunity cost	≤2000	52	41.3	Mean= 3784.72 taka SD= ± 2810.6
	2001-4000	34	27.0	
	4001-6000	22	17.5	
	6001-8000	5	4.0	
	8001-10000	9	7.1	
	>10000	4	3.2	
Chemotherapy related cost		**Frequency**	**Percent**	
Cost of chemotherapy cycles (TK)	≤10000	16	22.5	Mean= 38358.59 taka SD= ± 29628.92
	10001-20000	18	25.4	
	20001-30001	10	14.1	
	30001-40000	6	8.5	
	40001-50000	6	8.5	
	≥50001	15	21.1	
Hospital Staying cost (TK)	≤1000	34	47.9	Mean= 8200.32 taka SD= ± 6833.18
	1001-2000	5	7.0	
	2001-3000	8	11.3	
	3001-4000	2	2.8	
	4001-5000	5	7.0	
	≥5001	17	23.9	
Opportunity cost (TK)	≤1000	34	47.9	Mean=6794.65 taka SD= ± 5071.61
	1001-2000	5	7.0	
	2001-3000	8	11.3	
	3001-4000	2	2.8	
	4001-5000	5	7.0	
	≥5001	17	23.9	

Table 1: Distribution of total cycles of Radiotherapy & Chemotherapy related costs taken by the respondents (n=126)

The highest number i.e. 22.3% of respondents had Breast cancer, 18.6% had head neck cancer, 12.0% had Cancer of larynx and vocal cords, 11.0% had Ca cervix. The majority of the respondents (78.1%) visited physicians more than 5 times. The highest number 126(41.9%) of respondents had taken Radiotherapy, 71(23.6%) had Chemotherapy and 104(34.6%) had combined Radiotherapy and Chemotherapy. Among the respondents 95.2% had taken 1 cycle of radiotherapy, 85.9% and 14.1% had < 2 & > 3 cycles of chemotherapy respectively.

Table 5 (page 34) shows the total of average household expenditure of the respondents including the cost of cancer treatment. In the case of radiotherapy, chemotherapy and in combined therapy the household expenditures were Tk1,37,257.65, Tk.5,06,320.89 and Tk. 3,33,845.83 along with treatment costs of the respondents.

Table 6 (page 34) shows the relationship between types of treatment (RT or Chemo or both taken by the participants) and expenditure on food. In the case of radiotherapy the majority, 72.2%, had cost of food < 5000 taka. In the case of chemotherapy the majority, 66.2%, had cost of food < 5000 taka and respondents who had both radiotherapy and chemotherapy had household cost of food at 52.9%.

Variables		Radiotherapy		Chemotherapy		Both
Household Income (In Taka)	mean	10953.97	mean	9852.11	mean	44100.00
	SD	± 8213.80	SD	± 8255.90	SD	± 34781.48
House hold expenditure on food (In Taka)	mean	5427.78	mean	4788.73	mean	6855.77
	SD	±3980.30	SD	±2480.87	SD	± 4492.53
House hold expenditure on Education (In Taka)	mean	1733.33	mean	1470.42	mean	2849.04
	SD	±1342.10	SD	±1278.33	SD	±1980.67
House rent (In Taka)	mean	687.30	mean	556.34	mean	703.85
	SD	± 345.98	SD	± 432.51	SD	± 661.69
Mean household expenditures (In Taka)		7848.41		6815.49		10408.66

Table 2: Distribution of average household Income & different Expenditures of the respondents by types of treatment

Treatment cost of respondents	Radiotherapy	Chemotherapy	Combined therapy
Total Direct cost (In Taka) PPP$ %	43,032.77 1815.72 33.25	3,31,175.54 13793.65 65.44	71,779.71 3028.64 22.19
Total indirect cost (In Taka) PPP$ %	82,591.75 3484.88 63.82	1,61,535.21 6815.83 32.33	1,71,557.69 7238.72 53.04
Opportunity cost (In Taka) PPP$ %	3,784.72 159.69 2.92	6,794.65 286.69 1.36	8,0099.77 3379.73 24.76
Total cost of treatment (In Taka) PPP$ %	1,29,409.24 5,460.30 100.00	4,99, 505.40 21, 076.17 100.00	3,23,437.17 13,647.13 100.00

† PPP$: purchasing power parity dollar or international dollar which was estimated to be equal to 23.7 taka by comparing 2007 GNI per capita in US dollars (470 $) and PPP(1340 PPP$) from World Bank database (and the exchange rate of 1 US$ = 68.59 taka in 2009

Table 4: Groupwise total of the average costs of treatment of the respondents

	Direct cost				Indirect cost			
Types of treatment	Mean direct cost (Taka)	Total cost of physicians visits (Taka)	The total cost of daily rent in hospital staying (Taka)	Other costs including investigation, surgery & medicine (Taka)	Mean indirect cost (Taka)	Cost of lost asset (Taka)	Earning wage loss (Taka)	The total amount of loans (Taka)
Radiotherapy	43,032.77	3073.65 (±2397.28)	9173.41 (±.8509.71)	30785.71 (±26038.75)	82591.75	29160.00 (±26980.01)	33217.46 (±30457.12)	20214.29 (±19086.32)
Chemotherapy	33,1175.54	2625.92 (±2098.15)	8815.56 (±8264.03)	21676.06 (±19891.23)	161535.21	69225.35 (±57908.78)	78281.69 (±76985.22)	14028.17 (±12095.21)
Combined therapy	71,779.71	6591.25 (±5219.87)	15890.38 (±2468.06)	49298.08 (±26783.99)	171557.69	76990.38 (±73098.56)	71634.62 (±69078.54)	22932.69 (±20984.21)

Table 3: Distribution of total direct and indirect cost of Radiotherapy and Chemotherapy, combined therapy related costs taken by the respondents

Treatment cost of respondents	Radiotherapy	Chemotherapy	Both
Total cost of treatment (In Taka) PPP$ %	1,29,409.24 5,460.30 94.28	4,99, 505.40 21,076.17 97.40	3,23,437.17 13647.13 96.88
Mean household expenditures (In Taka) PPP$ %	7848.41 331.15 5.71	6815.49 287.57 1.32	10408.66 439.18 3.11
Total expenditure of household including treatment cost (In Taka) PPP$ %	1,37,257.65 5,791.46 100.00	5,06,320.89 21,636.75 100.00	3,33,845.83 14086.32 100.00

Table 5: Groupwise total of the average household expenditure along with treatment cost of the respondents

Types of treatment	Food expenditure			
	≤5000 Taka (%)	>5000 Taka (%)	Total	Chi-Square Tests
Radiotherapy	91	35	126	χ^2=15.765 p = 0.003
	72.2%	27.8%	100.0%	
Chemotherapy	47	24	71	
	66.2%	33.8%	100.0%	
Combined therapy (Radiotherapy and Chemotherapy)	55	49	104	
	52.9%	47.2%	100.0%	
Total	193	102	301	
	64.1%	35.9%	100.0%	

Table 6: Relationship between types of treatment (RT or Chemo or both taken by the participants) and expenditure on food

Relationship between types of treatment and household cost of food was significant (p =0.003).

Table 7 (next page) shows the relationship between types of treatment (RT or Chemo or both taken by the participants) and transport cost. In the case of the majority of respondents there were transport costs <1000 taka. There was a significant relationship between types of treatment and transport cost (p=.05).

Types of Treatment	Transport cost				Chi-Square Tests
	<1000	1001-2000	≥2001	Total	
Radio therapy	88	25	13	126	$\chi^2 = 9.509$
	69.8%	19.8%	10.3%	100.0%	p = .05
Chemotherapy	44	12	15	71	
	62.0%	16.9%	21.1%	100.0%	
Both	56	30	18	104	
	53.8%	28.8%	17.3%	100.0%	
Total	188	67	46	301	
	62.5%	22.3%	15.3%	100.0%	

Table 7: Relationship between types of treatment (RT or Chemo or both taken by the participants) and transport cost

Discussion

Socio economic characteristics of the respondents:

This distribution of socio economic characteristics was used as an aggregate tool for overall analyses of the objectives. The results of the study revealed that 46.2% of the respondents were within age group of 40-59 years and 26.9% from the age group 60-79 years, whereas 20.6% were from the age group 20-39 years and 2.3 % were from above the age group of 80 and above. So 74.4% patients were from the age of 40-80 years and above age. Though Cancers develop in all ages Cancer is common in older age. In the UK Cancer occurs predominantly in older people, with three quarters of cases diagnosed in people aged 60 and over, and more than a third (36 per cent) of cases in people aged 75 and over. The risk of an individual child in the UK being diagnosed with cancer before the age of 15 is about 1 in 500. Around 1 in 10 of all cancer cases in adults are aged 25-49 years. Breast cancer accounts for nearly half (46%) of all cancers diagnosed in UK women aged 40-59 years.(5) In Bangladesh the mean age of the cancer patients was 48.21 years. 44.5% patients were from 40-59 years of age. 4.0% cancer patients were of the pediatric group (0-15 years). About 19.14% of all cancers were from geriatric (over the age of 65 years and above) age group(4).

In this study the majority of the respondents were Muslim. 92% of patients in this study were Muslim. Islam is the largest religion of the country. 89.6% of population are Muslim.(6) So the majority of the patients are from the same religion. In Bangladesh 92.6% of cancer patients were Muslim.(4)

This study revealed 96.7% were married. As the legal age of marriage in the country for females is 18 years and for males 21 years.(7) In this study only 4.0% of participants were below the age of 20 years. In Bangladesh 92.6% of cancer patients were married.(4)

In this study the majority of the respondents were females as they were selected randomly. 46.8% were male and 53.2% were female. In Bangladesh Male: female ratio of cancer was 1.4: 1.0. 58% of all cancer patients were male and 42% were female.(4)Among 160 females 42.9% were housewives. Among the males the highest number were service holders 21.3%, 15.9% were farmers, 8.3% were day laborers and 6.6% were Businessmen. According to the different study findings incidence of cancer varies between different occupational groups. A study in Norway from 1960-1990 on 15 million people reveals 2.8 million cancer cases among the study population who had exposure to smoking, alcohol in work places and exposure to chemicals increases the toll of death.(8) In Bangladesh housewives were suffering more from cancer and 34.9% housewives were suffering from cancer. Among others 16.6% were agriculture workers, 10.5% were service holders, 8.3% were Businessmen, 6.1% were day laborers who were suffering from cancer.(4) The reasons for the higher number of cancers in housewives includes the prevalence of two cancers Cervical cancer and Breast cancer. Cervical cancer is highest in number in Bangladesh and commonly occurred in married multiparous women whereas Breast cancer also developed in older females.

Family size was 4 or less in 36.2% and 5 or more in 63.8% respondents in the study. The mean family members of the participants' household were 5.62. In Bangladesh the average family size is 4.85.(9)

Numbers of earning members and dependent members were < 2. 83.4%. The mean numbers of household members were

1.78. 39.9% respondents had income of 5001-10000 taka. In Bangladesh average earners per household were 1.40, average income per household was 7203 taka and monthly expenditure 6134.07 taka. Income per earner in the country was 5145 taka.(9) Among the cancer patients of Bangladesh 53.3% had income of 1001-3000 taka, 19.8% had 3001-5000 taka, 13% had 5001-1000 taka. Only 5.4% had income above 10000 taka.(4) If the study sample size were large and classified in smaller income groups then findings can be comparable easily with the available national data.

Among the participants 50.2% had possession of land and 87.7% (72.0% lived in kaccha house and 28.0% lived in Pucca house) had possession of a house. In Bangladesh 55.2% of the population had land of .01-.49 acres. 53.15% of households lived in thatched house (type-5).(10)

The numbers of households of the respondents' expenditure on food is highest 64.1% below or equal to 5000 taka. 28.6% had expenditure on food between 5001-10000 taka and 7.3% had expenditure on food above 10001 taka. The mean household expenditure on food was 5770.435 taka per month. In Bangladesh household expenditure on food is 3209 taka.(11) The costs became higher as the household of the patients needed extra special diet which increased the expenditure.

Among the respondents 31.6% had no Household expenditure on education. 27.2% had household expenditure of education of 705.0 taka As the households had no members of age of education or had already completed the education expenditure equal to or less than 2001 taka.

The mean house rents were 662.13 taka of the respondents. 83.1% did not have the expenditure of house rent as 87.7% had their own house. But all the respondents were not staying in their own house. 87.7% respondents had their own house.

Among the respondents 62.5% had transport costs of 1000 taka or less in the household. 22.3% had transport costs of 1001-2000 taka and 15.3% had transport costs equal to or more than 2000 taka. The majority of the respondents were from different parts of the country especially there were rural dwellers. But others live in the town or city where transport costs were higher than other parts of the country.

Among the respondents 41.9% were diagnosed within 6 months. 27.9% were diagnosed within 1 year and 30.2% were diagnosed more than 1 year. 58.1% of the respondents were considered as old patients who were diagnosed around 1 year while others were considered as new. For the diagnosis of cancer and further management 78.1% participants visited more than 5 times to the physician for management, as the diagnosis tests, histopathological tests, surgery, follow up, and medication needed more visits.

As the major respondents were female, 22.3% respondents had Breast cancer. 11.0% had Ca cervix and 4.7% had cancers of other female genital organs. 20% had Head neck cancer, which includes all cancers of the head neck region including cancer of the sub mandibular region, lymph nodes of the head-neck region, oral cancers and also brain tumors. 12.0% had cancer of the Larynx and vocal cords; only 6% had lung cancer. Among the variety of cancers 55.1% had metastasis in different parts of the body. In Bangladesh 16.7% had lung cancer, 10.4% had Ca-cervix, 10.3% had Breast cancer, 7.1% had Cancer of GIT, 6.2% had unknown primary site, 5.5% had lymph node and Lymphatic cancer, 5.0% had Laryngeal cancer, and 3.9% had oral cancer.(4) Females had almost the same prevalence of Cervical and Breast cancer. These two are the predominant cancers among the patients. In other types the number varied as the sample was selected randomly.

There were several types of treatment modality of cancers which depend upon the types of cancer with grading and staging. 41.9% of the respondents had radiation therapy whereas 23.6% had chemotherapy. Both radiation and chemotherapy were taken by 34.6% participants. The majority of the respondents, 95.2%, had 1 radiotherapy cycle. The mean shots required for the respondents were 25.39. The radiotherapy cycles vary with different types of cancers along with their grading and staging. The goal of radiation therapy is to damage as many cancer cells as possible, while limiting harm to nearby healthy tissue. Radiation therapy may be used to treat almost every type of solid tumor, including cancers of the brain, breast, cervix, larynx, lung, pancreas, prostate, skin, spine, stomach, uterus, or soft tissue sarcomas. Radiation can also be used to treat leukemia and lymphoma. The highest percentages of costs of radiation therapy were 38.1% within 4001-6000 taka. 23.0% had costs of < 2000 taka, and for 15.1% the costs of radiotherapy were 2001-4000 taka. Only 10.6% had radiation therapy cost ranges from 8000 - above 10000 taka. The mean costs were 5251.48 taka. The costs vary as there were different machines used for radiation like Cobalt 60, linear energy transfer (LET) machines. Some respondents also took treatment in Private settings before they came to the Govt. Hospital which raised the cost in some patients.

Radiotherapy is given as outdoor management. The majority of the patients usually are not admitted to the hospital for radiation therapy. Though the Govt. gives radiation facilities at subsidized rates compared to private settings, the cost rose because of daily travel, food and opportunity costs of the patients and their attendants. The cost of all types increased as the minimum shots were 25.39. So the patients should come to the facility on average for 25 days. The highest percentage of average daily cost of travel and food for the radiotherapy patients were 77.0% within 100-<500 taka. The mean costs of food and travel of the radiotherapy patients was 5251.48 taka. Opportunity costs of RT of the participants were 41.3 % < 2000 taka. 27.0% had costs of 2001-4000 taka, 17.5% had costs of 4001-6000 taka. The mean opportunity costs were 3784.72 taka.

Like Radiotherapy, Chemotherapy varies with different types of cancer grading and staging. It also depends on height, weight and age of the patients. Number of chemotherapy

cycles < 2 were 85.9% and >3 were 14.1%. 25.4% respondents had chemotherapy costs of 10001-20000 taka, 22.5% had costs < 10000 taka, 21.1% had costs >50001 taka. The mean cost of Chemotherapy was 38358.59 taka. The costs of chemotherapy varied as there were multiple cycles. Chemotherapy is usually given to the admitted patients or on a day case basis. Hospital Stay costs for chemotherapy were < 1000 taka in 47.9%, 23.9 % had costs of >50001 taka, 11.3% had costs of 2001-3000 taka. Only 2.8% had costs of 3001-4000 taka. The mean hospital staying costs were 8200.32 taka. It also varies as the patients had different numbers of chemotherapy sessions and a varying number of hospital stays. The opportunity costs for chemotherapy were < 1000 taka in 47.9%, 23.9 % had costs of >50001 taka, 11.3% had costs of 2001-3000 taka. Only 2.8% had costs of 3001-4000 taka. The mean opportunity costs were 6794.65 taka.

Total household expenditure in cancer treatment of the respondents:

The total of average household expenditure of the respondents who received radiotherapy, chemotherapy and both radiotherapy and chemotherapy were Tk.7848.41, Tk.6815.49 and Tk.10408.66 respectively. The total of average direct costs of radiotherapy, chemotherapy and both radiotherapy and chemotherapy were Tk. 43,032.77, Tk. 33, 1175.54 and Tk. 71,779.71 respectively. The total of average indirect costs of radiotherapy, chemotherapy and both radiotherapy and chemotherapy were Tk. 82,591.75, Tk. 1,61,535.21and Tk. 1,71,557.69 respectively. So, the average total costs of radiotherapy, chemotherapy and combined therapy treatment costs were Tk. 1,29,409.24, Tk. 4,99, 505.40, Tk. 3,23,437.17 respectively. In the case of radiotherapy, chemotherapy and in combined therapy the household expenditures became Tk1,37,257.65, Tk.5,06,320.89 and Tk. 3,33,845.83 along with treatment costs of the respondents. The costs were very high as the direct costs and indirect costs of the treatment increased, which raised the medical expenses of the households. So, the average household expenditures of the cancer patients were raised and the family of the patients thrown into economic burden.

Relationship between types of cancer and household expenditure of the respondents:

There were variations in household expenditure in different types of cancer. The majority of the respondents had cost of food in household expenditure < 5000 taka. Among them Cancer of the limbs and vertebral column contributed 76.9%, Head and neck cancer 69.6%, and Breast cancer 65.7%.

Among the respondents 31.6% did not have education costs and 78.4% had education costs in the household. The majority of the respondents who had costs of education in household expenditure were < 2000 taka. Among them Brain cancer contributed 50.0%, Head and neck cancer 48.3%, Cancer of limbs 46.2% etc.

Among the respondents 83.1 % did not have house rent and only 16.9% had house rent. The majority of the respondents who had no house rent in household expenditure were Cancer of GIT, Head and neck cancer, Lung cancer etc. Of the respondents who had < 1000 taka, 18.2% had Ca cervix, 15.4% in cancer of limbs.

The majority of the respondents had transport costs in household expenditure at < 2000 taka. Among them Brain cancer contributed 100.00%, Breast cancer 98.1%, Ca cervix 97.0%.

It was difficult to explain why those variations occurred. If the equal sample size of different types of cancer were compared with socio-demographic characteristics then a good interpretation could be outlined. But the current study only set the objectives to observe the difference of household expenditures in different types of cancer.

Relationship between types of treatment and household expenditure of the respondents:

Among the participants who had radiotherapy, they had household income on average of 10953.97 taka. Their household expenditure on food, education and house rents was 5427.78 taka, 1733.33 taka and 687.30 taka. The participants who had chemotherapy had household income on average of 9852.11 taka. Their household expenditure on food, education and house rents was 4788.73 taka, 1470.42 taka and 556.34 taka.

In the case of radiotherapy the majority, 72.2%, had cost of food < 5000 taka. In the case of chemotherapy patients the majority, 66.2 %, had cost of food < 5000 taka and respondents who had both radiotherapy and chemotherapy had household cost of food at 52.9%.

In the case of the majority of the respondents of radiotherapy and chemotherapy 33.3% and 36.6% respectively had no education cost in the household in the case of respondents who had education costs i.e. 36.5%. In the case of the majority of respondents there were no house rents. In the case of the majority of respondents there were transport costs of <1000 taka.

Total cost of treatment of radiotherapy, chemotherapy and both the total treatment costs were Tk.13,0576.49, Tk.20,3017.82, Tk.32,4980.54. But the household expenditures were Tk. 7848.41, Tk. 6815.49, Tk. 10408.66 in radiotherapy, chemotherapy and in those who had both, respectively. So the difference between treatment cost and household expenditures was Tk.12,2728.08, Tk.19,6202.33 and Tk.31,4571.88.

In this study significant relationships were found between types of treatment and household expenditure on food and transport costs. Relationship between types of treatment and household cost of food were significant (p= 0.003). Like any other illness cancer patients needed improved diets which increased the costs of food in households. There was a significant relationship between types of treatment and transport costs (p=.05). Due to illness for treatment patients needed more traveling which increased the transport cost.

Comparison of different types of costs of Cancer patients with National standard data:

Direct costs of the participants of Radiotherapy include Physicians costs which were 3073.65 taka. Hospital staying costs were 9173.41 taka, diagnosis cost, surgery and medicine costs were 30785.71 taka, transport costs were 1168.25 taka. Direct costs of the participants of Chemotherapy include Physicians cost which were 2625.92 taka. Hospital staying costs were 8815.56 taka, diagnosis cost, surgery and medicine costs were 21676.06 taka, transport costs were 1570.42 taka. Direct costs of the participants of the both Radiotherapy and Chemotherapy include Physicians cost which was 6591.25 taka. Hospital staying costs were 15890.38 taka, diagnosis cost, surgery and medicine costs were 49298.08 taka, transport costs were 1553.37 taka.

Household expenditure cost on food was 5770.43 taka, Household expenditure cost on education 2056.81 taka and Household expenditure cost as house rent were 662.13 taka. The National standard showed household costs of food, education, and house rent were 3209 taka, 705 taka, 750 taka. (12) Except for the house rents there was a significant difference between studied patients and National standards. The respondents' cost of food and education were significant in relation to National standard data. (p= 0.05).

The expenses of Doctor visits, hospital /clinic fee, investigation and medicine costs of the respondents were 4183.42 taka, 11409.82 taka, 35033.22 taka whereas the National standard data revealed costs of Doctors visits, hospital /clinic fee, investigation and medicine costs to be 115 taka, 1156 taka, 795 taka.(9) The respondents cost of Doctors visits, hospital /clinic fee, investigation and medicine costs were significant in relation to National standard data. (p=0.01). The comparison stated that cancer treatment increased all the expenditures of households except the house rents. That put the households in extra economic burden.

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Seed oil composition of red raspberry (Rubus ideaus) fruit in Sulaimani city

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ABSTRACT

The seed oil component of red raspberry (Rubus ideaus) fruit which grows in Sulaimani city, Iraq (season 2011) was determined. Red raspberry seed oil is a rich source of poly-unsaturated fat including omega-3 fatty acids and antioxidant active compounds, including tocopherols and tocotrienols. Tocopherols are primarily gamma and alpha tocopherol. Analysis of Seed oil composition of red raspberry fruit shows 10.5mg/100gm of alpha tocopherol, 17.5mg/100gm of gamma tocopherol; the total tocopherol is 29.0mg/100gm. It has been found that the studied seed oil of red raspberry fruit contains fatty acids like palmatic acid 3.0%, stearic acid 1.2% , oleic acid 12.0% , linoleic acid 53.2% and linolenic acid 30.0%. Seed oil contains a high level of polyunsaturated fat (omega-3 fatty acid linolenic acid (18:3), and omega-6 fatty acid linoleic acid (18:2)). The analysis of raspberry ketone shows (0.267mg/100g) of Framinone.

Introduction

Red raspberry is a plant which stands about 6 feet tall. It is often found growing wild in hedges. It may be a vine or shrub but tends to grow in thickets. It belongs to the genus(Rubus); the genus Rubus is a member of the rose family (Rosaceae). It is cultivated and grows wild in Sulaimani city- Iraq(1).

A local name of red raspberry fruit in Kurdish is totirk(1). Red raspberry seed oil is important because it contains high levels of vitamin E in the form of alpha -tocopherol and gamma -tocopherol ,which are the most active form of vitamin E to protect the skin ,and also protects from damaging UV -A and UV-B rays, and has a well known function in skin repair and conditioning, which is related to antioxidant properties(2). Tocopherols are lipophilic antioxidants that present in some oil and nuts(3) but their presence in red raspberry seed could provide vitamin E activity and antioxidant potential as well(4). Red Raspberry seed oil is known especially for its prevention of skin disease and it is used as a cosmetic based in part on its anti-inflammatory activities, which is superior when compared to those of other well-known oils such as virgin avocado oil and grape seed oil(5). Recent studies of red raspberry seed oil show that the important fatty acids found in raspberry seed oil are lenoleic, alphalenolenic and oleic acid(6).

Research proved that the composition of omega -3 and omega-6 fatty acid provides reduction of the effect of oxidative stress in skin (7). Red raspberry ketone is a natural phenolic compound (aroma compound). It is used in perfumery, in cosmetics, and it is one of the most natural flavor components used in the food industry (8). In 1965, the food and drug administration placed raspberry ketone on generally recognized as safe (GRAS) status (9).The raspberry ketone can be prepared industrially by a variety of methods from chemical intermediates (10). When it is given to mice in high doses, up to 2% of food intake, raspberry ketone has been shown to prevent high-fat-diet-due to increasing the body weight (11).

Material and Methods

Red raspberry fruit was harvested by hand in its optimum state for two consecutive seasons in 2010 in Sulaimani city, Iraq. After a morphological and chemical characterization, the sample was prepared for determination of oil, fatty acids, vitamin E and ketone raspberry.

Preparation of the sample for the determination of total oil contents

The seeds of red raspberry fruit were oven-dried at 50 °C for 18 hours and ground through a Wiley mill to pass through a 30-40 mesh screen, and stored tightly at 4 °C. 10g of the seed was extracted with petroleum ether (40-60° C) using a Soxhlet apparatus according to AAcc methods(12). The oil was recovered by petroleum ether evaporation in a rotary evaporator at a 60 °C (Heidolph Laboratory 4003 control). The oil was dried in a desiccator for 1 hour and finally the extracted oil was weighed. The percentage of total oil content is 15.5%; the characteristic properties of the oil were determined by conventional methods (13), and the result is presented in Table (1).

Fatty acid composition

The fatty acid composition was analyzed by trans esterification of 10mg of oil with 0.5M sodium methoxide (0.5ml) directly from the seed at 50 °C for 30 minutes in a sealed crimp cap vial. The solution was quenched with 0.5ml of 0.5M HCl, after first diluting in 2ml of hexane. The hexane layer was withdrawn, placed in a 2ml crimp top vial, and injected directly on to the gas chromatograph (GC). GC analyses were performed on a BPX -70 polar 0.25 mmx30m column. (The test was done in Imperial college-UK). The temperature ramp was from 150 to 250 °C at 50C/minute with the injector and detector set at 250 °C. The saturated C8 to C30 fatty acid methyl esters provided standards for calculating equivalent chain length values used to make fatty acid methyl ester assignment.

Tocopherols

Tocopherol quantification was based on a method by Podda et al (14) . 250 mg of powered whole seed was saponified at 70 °C in 2.5 ml of 1 % ascorbic acid, 5ml of l of 95% ethanol, and 1.5 ml of saturated KOH for 30 min. The sample was cooled at room temperature whereupon 2.5 ml of 1% (w/v) ascorbic acid and 50 ml of butylated hydroxy toluene (1`mg/ml in ethanol) was added. The sample was then extracted with 5ml of hexane, vacuum-dried and re-suspended in 1:1 volume methanol: ethanol from this sample 50 µL was injected through a Develosil R-P-AQUEOUS Column (phenomenex) in a 99:1 methanol: water ratio using water 2690 separation module. The peak was detected at 292nm with a photodiode array detector. (The test was done in Imperial college-UK).

Properties	Seed oil
Oil	15.5%
Color	Yellowish golden
Saponification value	190
Iodine value	140
Acid value	1.290
Peroxide value	1.5
Sp.Gr	0.3

Table 1: Chemical Analysis of red raspberry seed oil

External standard curves were made with pure α–, β, δ-, tocopherols.

Red raspberry ketone

2gm of red raspberry seed oil was steam distillated for 30 minutes. The (yellow oily) material was distilled, dried using Na2SO4 and evaporated in vacuum in a rotary evaporator at 60°C (Heidolpla Laboratory 4003) control. The determined weight was (0. 267) mg/100g oil, RF=0.65 (n-hexane: ethylacetate) (8:2). PYe Unicam SP-3005 IR-spectrophotometer was used during this work in the range of 600-4000cm,-1 for identification; Bruker (600MHZ) instrument was used (from Imperial college-UK) during this work for identification; T.L.C standard silica gel plates were used with 0.25mm thickness.

Thin-layer-chromatography T.L.C

To examine the essential oil (aroma compound) in red raspberry seed oil, thin layer chromatography technique has been performed. The fraction was applied with capillary tube along (0.2cm) above the rim of the plate of silica gel (0.25) thickness. The chromatogram was run in (n-hexane: ethylacetate) (8:2), the solution of 4-(4-hydroxyphenyl) butan-2one was used as a marker.

Flash column chromatography

The column (2× 25 cm) poured with silica gel has been used for purification of the essential oil (aroma compound)the compound 4-(4-hydroxy phenyl) butan-2one was eluted with (hexane: ethyl acetate) (8:2).The eluent solution was evaporated to dryness, and the resulting solid was re solubilized with suitable solvent for IR, and ‘H-NMR(15).

Result and Discussion

The total oil content in red raspberry fruit was 15.5%; the color for it was (yellowish golden). Table (1) shows the chemical analysis of red raspberry seed oil. The iodine value is often the most useful figure for indentifying oil or at least into a particular group which gives a reasonably quantitative measure for unsaturated oil (16). The saponification number represents the amount of saponifiable material which is inversely proportional to the mean of the molecular weight of the fatty acids in the glycerides present(16). The peroxide value is an indicator of the products of primary oxidation measures rancidity or degree of oxidation but not stability of a fat (17). A rancid test often begins to be noticeable when the peroxide value is between 10-20 (16) and the fatty acid composition of the red raspberry seed oil that is presented in Table (2) contains a high percentage of essential fatty acid linoleic acid, 53.2%, and linolenic acid, 30.0%. The red raspberry seed contains total tocopherols in the range of 29.0mg/100g seed, a-tocopherol was 10.5mg/100g seed andg -tocopherol was 17.5mg/100g seed.

The 1H-NMR spectrum of this compound Table (4), Figure (1) show signals as follows: [at δ-5.35 for OH group, at 6.70 for two CH group of phenyl group, at 7.12 for two CH group of phenyl group , at (2.78-2.80) corresponding to CH ,CH2 protons, at (2.13) to CH3 protons] and the IR spectrum of it, Table (5), Figure (2) shows these bands: [a broad band at (3200-3500)cm-1 corresponding to hydroxyl group (bonded), at (2850-2981) cm-1 indicates the presence of aliphatic CH stretching, high frequency at 1670 cm-1 indicating the presence of carbonyl group for ketone, at (1475) cm-1 indicates the existence of (C=C) group of aromatic ring, the absorption at (1400-1450) cm-1 indicates CH2,CH3 bending, at(1300-1000)cm-1 indicates the existence of C-O group and the bands below 900 cm-1 for C-H bending of aromatic ring].

Conclusion

The seed oil of red raspberry fruit in Sulaimani city, north of Iraq, is a rich source of polyunsaturated fats including omega-3 fatty acid (by using GC analysis aBPX-70 polar 0.25mm x 30m column and antioxidant active compounds including tocopherols). Tocopherols are primary gamma - and alpha tocopherol. This oil is very low in saturated fat, and contains 4-(4-hydroxyphenyl) butan-2 one which is a natural phenolic compound (aroma compound). It is one of the most important natural flavors used in the food industry.

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Fatty acid	%Fatty acid
16:0 palmitic acid	3.0%
18:0 stearic acid	1.2%
18:1 oleic acid	12.0%
18:2linoleic acid Δ9,12	53.2%
18:3 linolenic acid Δ9,12,15	30.0%

Table 2: Fatty acid composition in red raspberry seed oil as a percentage of total

α -tocopherol mg/100g seed	γ-tocopherol mg/100g seed	Total tocopherol mg/100g seed
10.5± 0.014	17.5 ± 0.017	29.0± 0.27

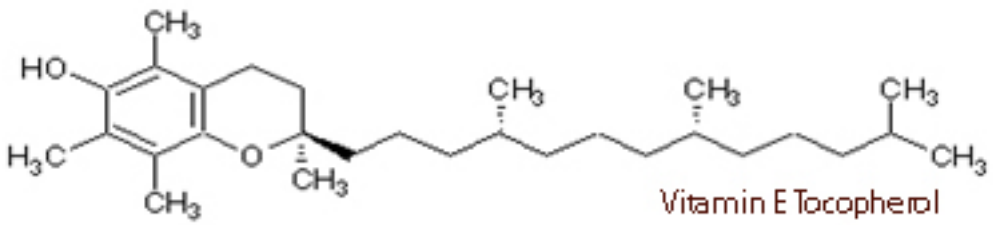
Table 3: Mean and standard Errors of Tocopherol composition in red raspberry seeds

δ in ppm	signal	Assignment
5.35	1H signal	OH group
6.70	2H signal	For two CH groups of (phenyl group)
7.12	2H signal	For two CH groups of (phenyl group)
2.78-2.80	4H broad	For two CH_2 groups
2.13	3H signal	For CH_3 group

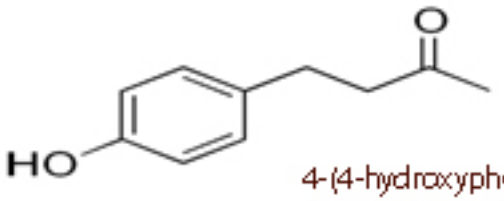
Table 4: 1H-NMR spectral data of the compound 4-(4-hydroxyphenyl)butan-2one

cm^{-1}	signal	assignment
(3200-3500)	Broad band	OH group banded
(2850-2981)	Multiple band	For CH_2,CH_3 stretching
1670	Signal band	For carbonyl group
1475	Signal band	For C=C group of aromatic ring
1400-1450	multiple	For CH_2,CH_3 bending
1300-1000	multiple	For C-o group
Below 900	multiple	For C-H bending of aromatic ring

Table 5: IR spectral data of the compound 4-(4-hydroxyphenyl)butan-2one



Vitamin E Tocopherol



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hernia. The procedure was tolerated well. Only 7% had mild discomfort. The method of assessing intra-operative pain was adapted from Ofili et al (17), where 58% of the patients felt no discomfort and 27% experienced mild discomfort. Baskerville and Jarrett (18) also reported that 93% of their patients denied any pain. Other studies (15,19) have also reported that most of the patients who underwent herniorrhaphy under local anesthesia, including those who had previous hernia repairs under general or spinal anesthesia, favored this procedure and volunteered that they would have it performed in the same way again if required.

The technique used for local infiltration anesthesia has been extensively described in the surgical literature (8) and can be performed by the surgeon and/or the anesthesiologist.

A potential advantage of local infiltration anesthesia is that it can be performed using so-called unmonitored anesthesia (10), although most centers prefer to use sedation as a part of a monitored anesthesia care technique to increase acceptance by patients and surgeons (6,7,8,9). Postoperative recovery is definitely faster with local anesthesia compared with general and regional anesthetic techniques. In addition, it can obviate the need for admitting these patients to the post anesthesia care unit which can facilitate an earlier discharge home after surgery (6,10,20). Postoperative pain is ideally treated with a multimodal approach involving both opioid and nonopioid analgesics (21). Local anesthetics are highly effective in alleviating postoperative pain when administered using both a peripheral nerve block technique (e.g., ilioinguinal-hypogastric nerve block) (22) and local wound infiltration at the fascial level (23). However, the duration of local analgesia after a single injection typically lasts nine hours (24).

In our series, the most common complication was bruising of the skin around the wound (13.6%); this resolved spontaneously and uneventfully within 3 to 5 days, as previously described by other authors (19,25) The 3% of scrotal hematomas occurred in the distal portion of large hernial sacs left behind. Our complication rate was comparable to the 0.75% (42) to 28.9% (15) reported in previous studies on herniorrhaphy under local anesthesia, where wound bruising was reported but not considered a complication. 22% of our patients had medical illnesses which would have made the administration of a general anesthetic more difficult. Young (15) found that the complications in patients with medical illnesses and those over 65 years of age were less under local anesthesia compared to either general or spinal anesthesia.

There were no recurrences in this series; the short follow up was inadequate to assess whether inguinal hernias repaired under local anesthesia were more prone to recur than those done under general anesthesia. It is known that if hernias were to recur, half of them would have recurred by the end of five years and three quarters s by the end of ten years of follow-up (7). The reported recurrence rates for repair under local anesthesia were 0.6% to 4.2% in primary hernias (26) and 0.8% to 4% in recurrent hernias (4, 25). Berliner et al (13) showed that inguinal hernia repair under local anesthesia resulted in a lower recurrence rate than repair under general anesthesia. This is probably because under local anesthesia, there is less likelihood of a repair being performed under tension. Furthermore, the cough stress test enables the integrity of the repair to be assessed intra-operatively and if defective, further steps can be taken to correct any deficiencies.

The choice of anesthesia depends on several factors, including patient and surgeon preferences, feasibility of the technique in a given patient, intra- and postoperative pain control, early recovery and monitoring requirements, postoperative morbidity, and perioperative costs. Given the recent studies confirming the benefits of local anesthetic-based techniques over both general and spinal anesthesia (6, 10), it is surprising that these techniques are so rarely used outside dedicated hernia centers. Despite the fact that it is safe, simple, and cost-effective, there is a lack of acceptance of local infiltration anesthesia within the surgical community.

Conclusion

In conclusion, there is a surprising discrepancy between the documented benefits of local anesthesia in reducing postoperative pain and anesthetic-related morbidity (as well as perioperative costs) in patients undergoing inguinal herniorrhaphy and the frequency with which this technique is used for this operation.

It is hoped that this paper has demonstrated how successfully such patients can be managed using local anesthesia. Its outcome and advantages have been described in detail in the hope that it may eventually become the anesthetic of choice in our hospitals.

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(References continued from *Pigmented villonodular synovitis of the Ankle and foot: A Case Report* page 42)

6 Pigmented villonodular synovitis (PVNSAdded by Gregory Mallo, last edited by Matt Steensma on Oct 07, 2008 (view change) Tumor template based on A Clinical Guide to Primary Bone Tumors. Levesque et al

7 Pigmented villonodular synovitis of the knee : A case report S Singh, V Chowdhury

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8 The use of surgery and yttrium 90 in the management of extensive and diffuse pigmented villonodular synovitis of large joints. S. Shabat1,2,, Y. Kollender1, O. Merimsky3, J. Isakov4, G. Flusser5, M. Nyska2 and I. Meller11 The National Unit of Orthopaedic Oncolog

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14 Pigmented Villonodular Synovitis Auther:Johnny uv monu,MD,associate professor of radiology and orthopaedics,university of Rochester school of medicine, updated. Jun 21,2007 medscape CME

15 Pigmented villonodular synovitis (PVNS) Added by Gregory Mallo, last edited by Matt Steensma on Oct 07, 2008 (view change) Tumor template based on A Clinical Guide to Primary Bone Tumors. Levesque et al.

Pigmented villonodular synovitis of the Ankle and foot: A Case Report

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Introduction

Pigmented villonodular synovitis (PVNS) is a locally aggressive disease process of uncertain etiology affecting the linings of joints, tendon sheathes, and bursae. Originally described in 1941 by Jaffe et al., this phenomenon affects 1.8 patients per million population, and presents most commonly in the knee and hip joints followed by the ankle and shoulder. Whereas the onset of this process is insidious in nature, if left untreated, it can become expansive involving adjacent osseous tissue. Although diagnosis in the past relied on combined clinical, radiographic, gross, and histological analyses, magnetic resonance imaging (MRI) has provided a useful means of diagnosis based on the relatively unique appearance of this lesion on T1- and T2-weighted images. Granowitz and Mankin divided PVNS into two forms: localised (nodular) and diffuse. Both forms can occur in the foot and ankle. A nodular variant, the giant cell tumour of tendon sheath (GCT), occurs in the flexor or extensor tendon sheaths of digits. Although now considered a benign tumour, PVNS was considered to be a low-grade synovial malignancy. The spectrum of clinical presentations ranges from a painless nodule or swelling to a diffusely painful, stiff joint. Most cases are monarticular and do not metastasise although they may be locally destructive.

As the natural history of PVNS is one of potential aggression, it is accepted that surgical excision is the only curative treatment, and total synovectomy is required for the diffuse form where recurrence is common. Marginal or intra-lesional excision by curettage may not eliminate the disorder. The nature of the anatomy in the foot and ankle makes complete excision difficult to achieve.

Radiotherapy (RT) has been used in the management of recurrent disease with moderate radiation doses. Where complete synovectomy cannot be achieved, local recurrences have been treated with RT. Blanco et al. combined partial arthroscopic synovectomy with external-beam RT at a dose of 26 Gy for cases of PVNS in the knee where posterior joint access was difficult and only partial excision could be achieved. A recurrence rate of 14% within 1 year of surgery was reported. We present the results of a similar combined approach to PVNS of the foot and ankle.

Case Report

This 67-year-old male presented with complaints of pain, swelling, and instability of his left ankle that had progressed in both intensity and frequency over the last year, which was out of proportion to mild degree of pain and discomfort. The patient's past medical history is significantly free from any medical illness, there is no history of any trauma for a left foot and ankle subsequently, the patient developed instability of this ankle. The patient described the pain as insidious, but more intense with weight-bearing and activity. He denied any recent trauma and stated that with immobilization the pain resolved, but that the swelling had become persistent. The patient subsequently underwent an MRI scan after routine X-rays of his ankle appeared normal. T-1 weighted images performed in the sagittal and axial planes demonstrated a diffuse hypodense infiltrative lesion involving the soft tissue structures about both sides of the ankle. The osseous anatomy appeared relatively spared from this pathologic process despite its intra-articular involvement. This decreased signal intensity appeared most predominant on the lateral aspect of the ankle; however, medial involvement was also noted at this level and more distally involving the hindfoot lobulated focal mass representing pvns tissue was seen along the anterior aspect of ankle and subtalor joint, in addition to bone marrow oedema. Bone isotope scan was done which showed evidence of increased flow blood pool around the ankle and foot. Biopsy from the tissue was taken which revealed benign synovial lesion with papillary projection made up of foamy cells admixed with a few hemosiderin laden macrophages and multinucleated giant cells embedded in dense fibrous tissue. Focal areas of osteochondrometaplasia are seen. There is no evidence of malignancy, and final diagnoses features are in keeping with villonodular synovitis with osteochondrometaplasia. The patient then underwent open synovectomy and resection of this mass through medial and lateral approach. Upon dissection through the subcutaneous layer, an infiltrative mass of brownish-yellow tissue was noted in both peroneal tendons. This process appeared to infiltrate extensively both proximally and distally. There was also destruction of the peroneal brevis tendon. Additionally, the mass appeared to involve both the ankle and subtalar joints and extended distally into the hindfoot, to the area of the sinus tarsi. This process infiltrated and destroyed the capsular attachments at the tibiotalar joint. Lateral excision was performed until no further dystrophic tissue was visualized. Medial exploration was then performed. Involvement was found in both the posterior tibial and the flexor digitorum longus tendons. Medial synovectomy with mass excision was additionally performed to a grossly clear margin. Osseous involvement of the tibia or talus was noticed either medially or laterally.

Pathology specimens of tendon with their associated sheathes and synovium were sent for analysis. At gross examination, multiple fragments of yellow, red and tan, dense, mottled tissue was received .The cut surfaces displayed areas of soft,

rusty-red, friable, granular material admixed with white, dense tissue.

Microscopic analysis revealed synovial tissue with several areas displaying a focal villous architecture. The predominant cellular constituents were large mononuclear cells with abundant, eosinophilic cytoplasm, and ovoid nuclei consistent with epithelioid histiocytes. Interspersed amongst these histiocytes were multiple multinucleated giant cells and scattered small lymphocytes. Coarse, granular hemosiderin pigment was present both intra- and extra-cellularly. Varying amounts of collagen bands were also identified dividing the sheets of epithelioid histiocytes. Focally, sheets of foamy histiocytes, were also readily identified. These features were consistent with those described for pigmented villonodular synovitis.

Post-operatively, this patient continues to have mild discomfort and swelling, and associated mild instability in the anteroposterior plane to an anterior drawer test.

The patient is presently bearing full weight in conventional shoes and may require a stabilization procedure in the future for his instability.

Discussion

PVNS is an aggressive disease, and there is a substantial incidence of re-growth.

When found in the foot and ankle, the large number of joints in this region and the lack of integrity of the superficial muscle layers assist in allowing spread to adjacent articular spaces. Complete excision is therefore difficult to achieve. Radiation oncologists have been reluctant to employ radiation in the treatment of benign disease for several reasons: (1) the small but not negligible risk of late appearance of radiation-induced malignant tumours; (2) the need to reduce the radiation dose if an independent neoplasm was to arise in the same region of the body; and (3) non-malignant tissue changes that might appear subsequently and complicate healing of surgical wounds.

However, the clinical seriousness of many benign processes has liberalised the use of radiation and clinical data indicate that moderate radiation doses can be effective.

The Princess Margaret Hospital reported on their experience with 14 patients with advanced recurrent disease .The dose was 30-50 Gy. There was a complete response in 13 of the 14 patients. These data suggest that a moderate radiation dose is an attractive option in recurrent disease. An alternative has been the injection of radioactive yttrium 90 locally. Blanco et al. combined anterior arthroscopic synovectomy and post-operative RT with a total dose of 2,600 cGy for primary diffuse PVNS of the knee. At an average follow-up of 33 months, 86% of cases did not show signs of recurrence, and there were no apparent harmful effects from RT.

Research is continuing into the anti-inflammatory properties of radiation and the optimal treatment regimes and some of the mechanisms are becoming clear. For example, low radiation doses may have an anti-inflammatory effect through modulation of the NO pathway in macrophages. Since the pathogenesis of PVNS is unclear, it is not possible to infer that radiation affects the disease through the same pathways, but it seems likely that chronic inflammation has some role, and this may be why RT can improve symptoms and prevent recurrence.

Estimates of risk after low radiation doses to joints are also difficult to define. Many studies have addressed the incidence of second malignancy after treatment for childhood cancers and common adult tumours. These studies, whilst instructive for specific populations, should not necessarily be used to estimate risk for patients without malignant disease. This is highlighted by the fact that some of these tumours occur with increasing frequency at non-irradiated sites and are therefore due to factors unrelated to treatment, possibly genetic pre-disposition. After treatment for benign disease such as Grave's ophthalmopathy in young patients, an absolute lifetime risk of radiation-induced cancer has been estimated at 0.3%. After treatment for joint disease at the knee or ankle in an adult, the only organ for which there is a quantifiable risk ofsecond malignancy is skin, and the estimated absolute lifetime risk is 22×10 -8 per Gy.

For the typical field size used in this study, this gives a risk estimate of three per 100,000. This small risk may be justified in patients with significant disability who may otherwise require radical surgery in order to achieve complete excision.

Although this study is too small to fully evaluate the benefit of radiation in these patients we have demonstrated that low-dose RT can be an effective adjuvant to surgery.

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(continued page 40)

Bochdalek's Hernia: A Rare Underlying Cause of Acute Gastric Volvulus in an Adult Patient

ABSTRACT

Background: Gastric volvulus is a rare condition that can lead to significant morbidity and mortality if diagnosed and treated late after strangulation has occurred. Common causes include abnormal laxity of gastric ligaments, hiatal hernia (paraesophageal), and post-gastroesophageal surgery. Bochdalek's hernia is a type of congenital diaphragmatic hernia that is usually asymptomatic and if present usually does so in childhood.

Objective: To report a rare case in which Bochdalek's hernia was found to be the underlying cause of acute gastric volvulus in adult patient.

Case report: An adult female patient presented with epigastric pain, frequent vomiting and fever of two day duration. Chest X-ray showed distended gastric fundus above the left hemidiaphragm. Chest and abdomen CT scan confirmed the presence of diaphragmatic hernia containing part of stomach, spleen and bowel. Barium meal study confirmed the presence of gastric obstruction. Patient was diagnosed as a case of diaphragmatic hernia complicated by acute gastric volvulus. At laparatomy a Bochdalek's hernia was found to be the underlying anatomical defect. Repair of the hernia was done after reduction of abdominal viscera and detortion of the stomach with gastropexy.

Conclusion: Bochdalek's hernia, although rarely symptomatic and usually presents in childhood if any, can be the cause of significant morbidities in adulthood including acute gastric volvulus.

Keywords: Bochdalek's hernia, congenital diaphragmatic hernia, acute gastric volvulus, strangulation, adulthood

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Introduction

Gastric volvulus is a rare clinical entity defined as an abnormal rotation of the stomach of more than 180°, creating a closed loop obstruction that can result in incarceration and strangulation. Most common causes are abnormal laxity of gastric ligaments, hiatal hernia (paraesophageal), and post-gastroesophageal surgery{1}.

Symptomatic Bochdalek's hernia in adulthood is even rarer {6,7}. Here we present a case in which a Bochdalek's hernia was found to be the underlying cause of acute gastric volvulus in an adult patient.

Case Report

A 16 year old female patient was admitted to the surgical ward with severe epigastric pain associated with frequent vomiting and fever of two day duration. There were no respiratory symptoms. On examination the patient had tachycardia (104 bpm) and low grade fever (38 c). Abdominal exam was unremarkable except for moderate epigastric tenderness. All lab results were within normal limits except for an elevated WBC count (14,000/mm3). Chest X-ray showed distended gastric fundus above the left hemidiaphragm (Figure 1 - next page). Chest and abdomen CT scan confirmed this in addition to the presence of part of the spleen and bowel along with it. Barium meal study confirmed the presence of gastric obstruction (fig 2). Diagnosis of diaphragmatic hernia complicated with acute gastric volvulus was concluded based on these findings. Adequate resuscitation was done and the decision was made for emergent laparotomy. At laparotomy the stomach, upper two thirds of the spleen, and distal one third of transverse colon were found to be displaced above the left hemidiaphragm through a 3-4 cm defect in the posterolateral aspect of the left hemidiaphragm "Foramen of Bochdalek". Also there was organoaxial volvulus of the stomach with early ischemic changes. Reduction of all herniated viscerae with detortion of the stomach and gastropexy was done followed by closure of diaphragmatic defect in two layers. Six months has passed since then and the patient is doing well with no symptoms of recurrence.

Discussion

Bochdalek's hernia is the commonest type of congenital diaphragmatic hernia {2}. It affects approximately 1 in 2200 to 12,500 live births {3}. Most of them are asymptomatic so that from all patients with a congenital Bochdalek's hernia only 5% will be diagnosed in childhood or adulthood {4}. It is rare in adults and accounts for about 0.17% to 6% of all diaphragmatic hernias {5}.

Symptomatic Bochdalek's hernia in adulthood is very rare {6,7}. Adult Bochdalek's hernia can present in two ways. They can give rise to vague, mainly gastrointestinal {2,8,9} (abdominal pain, nausea and vomiting, constipation) or respiratory {4,9} (chest pain, dyspnea, wheezing) symptoms, followed by severe attacks and episodes of incarceration with serious consequences. Characteristically, these symptoms

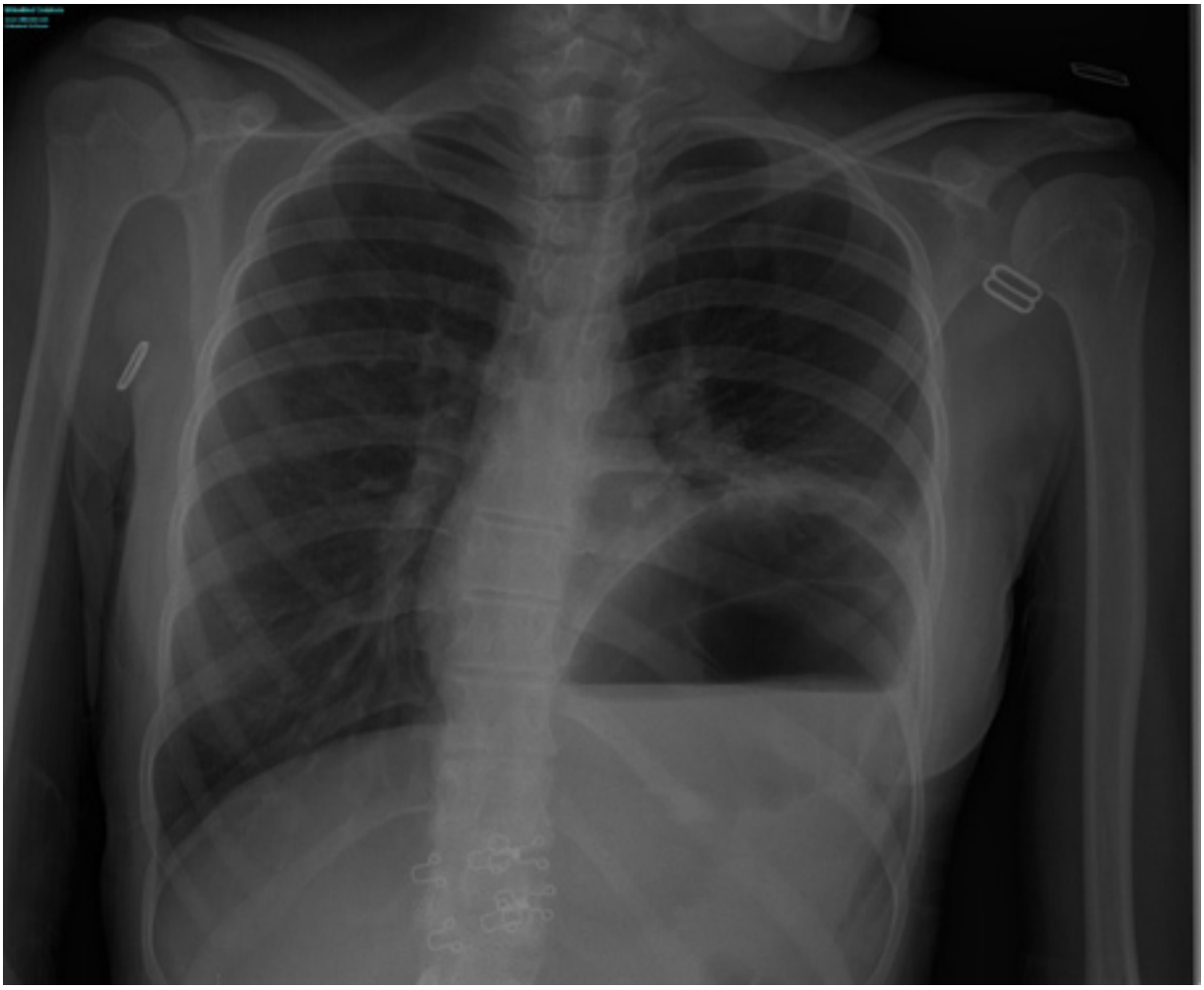

Figure 1

can be intermittent, as herniated viscera can spontaneously reduce causing symptom regression. In such cases, radiological investigations demonstrate reduction of the hernia with symptom resolution {7}. Others will present with serious complications associated with strangulation of herniated viscera, especially when the diagnosis has been missed or treatment delayed {10}. There have been reports of Bochdalek's hernia presenting with "sudden death" from intrathoracic complications {11}. Gastric volvulus is one of the rare but recognized complications of Bochdalek's hernia and the mortality in these has been high (32%) because of visceral strangulation {12}. Diagnosis can be reached with CXR during an attack especially when hollow viscera herniates though large defects {2}. CT can detect small asymptomatic Bochdalek's hernias {13} and a definitive diagnosis can be achieved with barium or gastrographin meal and enema {9}. Signs of incarceration or strangulation are absolute indications for emergency surgery {7}. A laparotomy incision represents the best approach because it allows better access to the abdominal viscera after reduction. This can be helpful when resection of an infarcted viscus is necessary or indeed, in cases of gastric volvulus where a gastropexy will be needed. In the age of minimally invasive surgery, laparoscopic repair {14} and video assisted thoracoscopic techniques {15} have been described for elective repair of Bochdalek's hernia.

In this patient the diagnosis of acute gastric volvulus complicating some type of diaphragmatic hernia - proved to be a Bochdalek's hernia operatively - was so obvious that the surgery was done after only a little enough time for resuscitation.

Conclusion

Although rare and usually asymptomatic, Bochdalek's hernia can be the underlying anatomical defect leading to acute gastric volvulus. To minimize morbidity and mortality surgery should be done as soon as the patient is resuscitated.

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Pulmonary Embolectomy After CPR For Post CABG Arrest

ABSTRACT

Background: To prove the importance of clinical diagnosis for pulmonary emboli and to show the important role of embolectomy as a choice of treatment methods

We present the case of an 81-year-old man who had an acute massive pulmonary embolism after CABG surgery. The patient had undergone ACB to major OM and diagonal +LIMA to LAD. 12 hours postoperatively, he required emergent intubation when he suddenly became cyanotic, severely hypotensive, and tachypneic, with an oxygen saturation of 60%. An acute massive pulmonary embolism was suspected, and an emergency transesophageal echocardiogram confirmed the diagnosis. On the basis of the patient's clinical condition and the echocardiographic findings, we performed an emergent pulmonary embolectomy, with the patient on cardiopulmonary bypass. We evacuated multiple large clots from both pulmonary arteries. The patient recovered and was discharged from the hospital 45 days postoperatively.

This case supports the use of open pulmonary embolectomy for the treatment of hemodynamically unstable patients on the basis of clinical diagnosis.

Key words: Embolectomy, emergencies, pulmonary embolism, Cardiopulmonary resuscitation.

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Introduction

Pulmonary embolism is one of the life threatening complications of open heart surgery. Pulmonary embolectomy was the mainstay of therapy for pulmonary emboli in 1960s and 1970s.presently, however, with the advent of effective nonsurgical therapy, pulmonary embolectomy is largely reserved for anatomically extensive central emboli with hemodynamic compromise or right ventricular strain, or for cases in which medical therapy has failed or is contraindicated. Massive pulmonary embolism is defined as obstruction of the pulmonary arterial tree that exceeds 50% of the cross-sectional area, causing acute and severe cardiopulmonary failure from right ventricular overload. Depending on the series reviewed, up to 50% of patients with pulmonary embolism experience a massive pulmonary embolism. Studies show that approximately 70% of patients who die of a pulmonary embolus die within the 1st hour after onset of symptoms, thus advocating rapid evaluation and intervention.(2) Definitive diagnosis is made on the basis of imaging studies (ventilation-perfusion scanning, contrast pulmonary angiography, computed tomographic [CT] angiography, and echocardiography). Anticoagulation and thrombolysis are the basic methods of treatment of pulmonary embolism. Inotropic support for hemodynamic optimization completes the axis of medical therapy. Surgical embolectomy has also been described in extreme cases. Massive pulmonary embolism with cardiopulmonary collapse at times precludes time-consuming imaging studies and requires urgent pulmonary embolectomy on the basis of clinical criteria and a high index of suspicion for pulmonary embolism.(1) Urgent pulmonary embolectomy in the surgical treatment of pulmonary embolism has received mixed reviews in terms of efficacy and associated morbidity and mortality. Opinions range from no need for pulmonary embolectomy in massive pulmonary embolism to pulmonary embolectomy for massive pulmonary embolism in patients without hemodynamic disturbances.(3)

We report a case of a massive pulmonary embolism that required an urgent pulmonary embolectomy on the basis of clinical impression and emergent transesophageal echocardiography (TEE). This report highlights the early use of open pulmonary embolectomy in the surgical treatment of acute massive pulmonary embolism.

Case Report

An 81-year-old man underwent CABG surgery. He became acutely cyanotic and went into acute respiratory distress 12 hours postoperatively. He was also hypotensive (systolic blood pressure as low as 50 mmHg) and cyanotic (SaO2 of 60% and PaO2 of 48.8 mmHg) and had to be intubated and started on high-dose inotropic support. At this time, given the acuity of the hemodynamic instability and the risk factors for deep venous thrombosis, an acute massive pulmonary embolism was suspected. The patient became hemodynamically stable for a short period of time after intubation and required high-dose inotropic support; however, he became more hemodynamically labile despite additional inotropic agents, with a blood pressure of 63/39 mmHg and a central venous pressure of 28 mmHg on epinephrine, dobutamine, and vasopressin support. The patient did not require cardiac massage throughout the resuscitative efforts.