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This is the last issue this year. We are glad to inform you that as of next year the journal frequency will be increased to six issues per year instead of 4 issues. At the end of the year we would like to wish all our readers, reviewers and production staff a happy new year and look forward to continuous success.

A retrospective paper from a Burns Unit in Jordan attempted to analyse the isolation pattern and antibiotics sensitivity pattern of microorganisms isolated from swabs taken from burn wounds. Growth was yielded in 66 (84.6%) and *Pseudomonas aeruginosa* was the predominant organism (43.6%). The authors concluded that every burn unit should have its own microbiology data and antibiotics sensitivity updated regularly in order to decrease the cost of management as well as both morbidity and mortality of the patients.

A retrospective study at Prince Rashed Hospital (PRH), Jordan, on patients undergoing maintenance hemodialysis looked at the Correlation of Serum Parathyroid Hormone Levels with some Biochemical and Cardiovascular Parameters in End-Stage Renal Disease. A total of 131 hemodialysis patients were included in the study. The data of the study suggests the inability of the dialysis unit to achieve the ranges of parathormone and mineral metabolism parameters recommended by KDOQI guidelines. This mandates the re-evaluation of current treatment of

end-stage renal disease, along with the implementation of newer modalities of hemodialysis and secondary hyperparathyroidism treatment.

A paper from Iraq looked at the Evaluation of the Dermatology Teaching Program in Tikrit University College Of Medicine. The authors stressed that evaluation is one of the essential elements of the educational process. They concluded that the fifth year dermatology teaching program had positive outcomes as revealed by graduation of competent physicians in the field of dermatology. However, Dermatology clinical assessment methods need reform and should be a performance based assessment as the clinical examination performed on a single case.

A nother prospective paper from Prince Rashid Bin Al Hassan Hospital looked at the issue of Selective or Routine Episiotomy. The overall episiotomy rate in the control group was 68% (n = 284) and in the study group 24 % (n = 118). The selective use of episiotomy resulted in a significant reduction in the overall episiotomy rate (P < 0.001) in their hospital. The authors concluded that selective use of episiotomy will decrease the number of episiotomies and perineal lacerations which resulted in considerable reduction in maternal morbidity due to perineal lacerations.

A retrospective study from Al Zarqaa city tried to determine the most common pathogen causing sepsis in young infants aged from birth to 2 months.

O ut of 700 cases who were admitted to Prince Hashim hospital, positive blood cultures were seen in 175 (25%) cases. The authors concluded that Coagulase negative staph (*CONS*), staph aureus, and klebsiella are species responsible for the majority of isolates causing sepsis, and that combination of third generation cephalosporin and aminoglycoside should be the first choice of treatment.

A nother retrospective study from Germany looked at early detection of bacterial sepsis in newborns admitted to the neonatal intensive care unit. The author stressed that neonatal infections are by far the most common cause of morbidity and mortality in infancy. Of the 73 blood samples clinically having suspicion of sepsis, there were twenty two samples that revealed positive blood cultures for bacteria. Based on their results, they deem high levels of IL-6 are more useful than CRP for detection of infection and positive blood culture especially within the time of admission to neonatal intensive care. They conclude that high IL-6 plasma level measurement might correlate with positive bacterial blood culture in neonatal sepsis.

Microorganisms in Burn Wounds

ABSTRACT

Introduction: Infection of burn wounds continues to be the main cause of morbidity and mortality in patients, with major thermal injuries, admitted to hospitals. Infection causes 50% to 60% of deaths among burn patients in spite of all efforts. Set up for prevention starts from burn unit establishment to intensive therapy with antibiotics, both topically as well as intravenous.

Aim: To analyze the isolation pattern and antibiotics sensitivity pattern of microorganisms isolated from swabs taken from burn wounds.

Materials and Methods: This retrospective study was carried out at the Burn Unit of King Hussein Medical Center from February 2009 to February 2010. A total of 78 burn wound swab samples from admitted patients were dealt with for analysis of antibiotics sensitivity.

Results: Growth was yielded in 66 (84.6%) and *Pseudomonas aeruginosa* was the predominant organism in our setup (43.6%), followed by *Acinetobacter* spp (10.2%) and *Klebsiella pneumoniae* (10.2%). The age of patients ranged from 2-64 years.

Conclusion: Every burn unit should have its own microbiology data and antibiotics sensitivity updated regularly in order to decrease the cost of management as well as both morbidity and mortality of the patients.

Key Words: Burns, Burn Ward, Burn Wound.

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Introduction

Infection in the burn wound continues to be the main cause of morbidity and mortality in patients admitted to hospital with major thermal injuries. Infection causes 50% to 60% of deaths in burn patients in spite of intensive therapy with antibiotics both topically as well as intravenous. Studying the microorganism' prevalence in burn wounds with antibiotics sensitivity is essential in the working strategy of burn centers. This study was carried out to analyze the isolation and sensitivity pattern of microorganism from the burn unit at King Hussein Medical Center.

Materials and Methods

This retrospective study was performed in the burn unit of King Hussein Medical Center from February 2009 to February 2010. Burn wound swab cultures for patients admitted to the burn unit were analyzed. Wound management in these patients consisted of daily washing and twice daily dressing with silver sulphadiazine cream or nitrofurazone ointment depending on burn depth and eschar formation.

Swab cultures were taken routinely twice weekly after cleansing of applied ointments, and at admission for all patients referred from other hospitals or if there was clinical indication such as fever or wound discharge. The wounds were swabbed and cultured as follows: A sterile cotton swab, moistened with sterile normal saline, was gently rubbed onto the burn wound surface.

In the laboratory the samples were dealt as per the routine protocol. Samples were inoculated on Blood Agar (Oxoid), MacConkey's Agar (Oxoid), Chocolate Agar, and Sabouraud's Agar as per the requirements. They are identified by the appearance of their colonies and results of biochemical tests. Sensitivity was done by disc diffusion method (Kirby-Bauer) using CLSI standards.

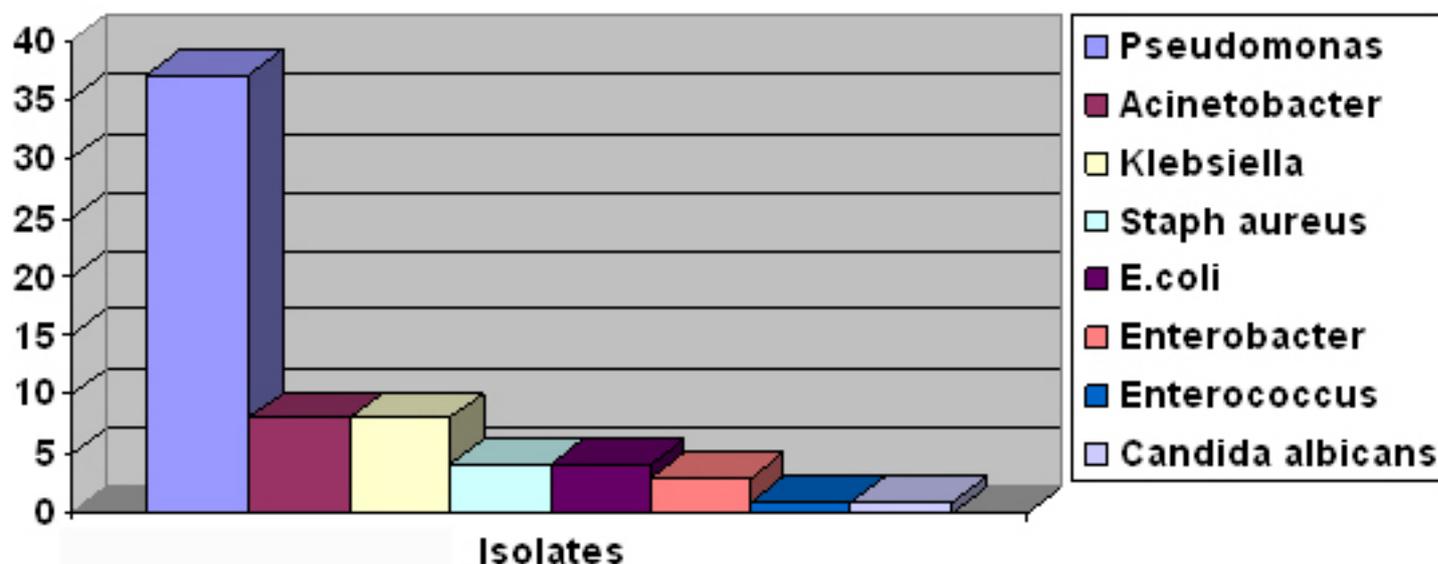


Figure 1: Isolation pattern of organisms

Antibiotic	Imipenem	Amikacin	Tazobactam	Aztreonam	Ceftazidime	Cefepime	Ciprofloxacin	Gentamicin
Micro-organism								
Pseudomonas aeruginosa	64%	41%	44%	19%	17%	19%	53%	23%
Acinetobacter spp	50%	25%	25%	25%	25%	25%	37.5%	37.5%
Klebsiella spp	75%	12.5%	62.5%	0%	0%	0%	87.5%	0%

Table 1: Antibiotic sensitivity of the three dominant microorganisms

Results

Data showed that age of patients ranged between 2-64 years with male predominance (66%). Cultures yield was 84.6%. Pseudomonas aeruginosa was the predominant organism in our setup (56%), followed by Acinetobacter spp (12.1%) and Klebsiella spp (12.1%); the least predominant organisms were enterococci (1.5%) and Candida albicans (1.5%) (Figure 1).

Discussion

Burn wounds colonization and ultimately infections remains a major challenge for all burn units worldwide and affects the quality of treatment and patient prognosis. It can jeopardize any attempt of cosmetic as well as functional treatment, e.g. it can compromise grafting procedures and subsequently increase scars and contractions. According to a previous study done in the same burn unit, the mortality rate for major burns was 29% with no deaths due to infections in minor and moderate burns.(1)

It has been estimated that 75% of all deaths in burns exceeding 40% of total body surface area are related to infection.(2) Initially, the burnt area is considered free of microbial contamination, but gram-positive bacteria in the depth of sweat glands and hair follicles heavily colonize the wounds within 48 hours of the injury.(3,4) Topical antimicrobials decrease

microbial overgrowth but seldom prevent further colonization with other potentially invasive bacteria and fungi. These are derived from the patient’s gastrointestinal and upper respiratory tract and the hospital environment.(5,6)

Following colonization, these organisms penetrate viable tissue depending on their invasive capacity, local wound factors and the degree of the patient’s immunosuppression.(6) If deeper tissue is invaded, disseminated infection is likely to occur.(4) Emphasis must therefore be on early identification of local signs of invasive burn wound infection.

The causative infective microorganisms in any burn facility change with time.(7,8) Individual organisms are introduced into the burns ward by the wounds of new patients. These organisms then persist as the resident flora of the burn treatment facility for a variable period of time, only to be replaced later by newly arriving microorganisms. Introduction of new topical agents and systemic antibiotics influence the flora of the wound.(7,8)

Pseudomonas aeruginosa remains the predominant isolate from the burns wards. In our study it was followed by Acinetobacter spp. The problem with the later species is that it is rapidly acquiring resistance to most of the available antimicrobial

agents. This would definitely lead to treatment failure in otherwise complicated burn cases.

It is just not sufficient to be aware of the microorganisms that pose a problem for burn patients. To have an in-depth knowledge of the organisms that are predominant in that particular treatment facility during the particular period along with their sensitivity pattern is vital as many septic burn patients need to be treated with antibiotics before the results of microbiological cultures are available. This would be crucial to reduce the overall infection-related morbidity and mortality.

Conclusion

Every burn unit should have its own microbiology data and antibiotics sensitivity updated regularly in order to decrease the cost of management and decreasing both morbidity and mortality of the patient. This in turn is a crucial measure for infection control.

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The Correlation of Serum Parathyroid Hormone Levels with some Biochemical and Cardiovascular Parameters in End-Stage Renal Disease

Abstract

Objective: To assay the levels of intact parathormone (iPTH) in end-stage renal disease (ESRD), to evaluate the possible relationship between the levels of parathormone and some biochemical and cardiovascular parameters, and to clarify the influence of some factors such as age, duration of hemodialysis (HD) and diabetes mellitus (DM) on the levels of this hormone.

Materials and Methods: This study was conducted retrospectively at Prince Rashed Hospital (PRH) on patients undergoing maintenance hemodialysis during August 2009 to August 2010.

Demographic and clinical data were obtained from charts review and Patients themselves. 2 - Dimensional echocardiography was performed in all patients. Blood samples were taken for parathormone and other biochemical measurements. SPSS package was used for statistical analysis. Statistical significance was considered at p value < 0.05.

Results: A total of 131 hemodialysis patients were included in the study; of these 76 (58.9%) were men. The mean age of the study population was 53.7 + 16.2 years. Mean serum iPTH level was 541.5 + 617 Pg/ml. Only ten (7.6 %) of our patients were within ranges recommended by Kidney Disease Outcome Quality Initiative (KDOQI) guidelines for mineral metabolism. The levels of iPTH were positively correlated with age, duration of hemodialysis, mean arterial pressure (MAP), pulmonary artery pressure (PAP), interventricular septal (IVS) thickness and serum levels of phosphorus and creatinine, while the levels of parathormone were negatively correlated with serum calcium levels and ejection fraction. On other hand, diabetes mellitus showed a negative effect on the Parathormone level.

Conclusion: The data of the study suggests the inability of our dialysis unit to achieve the ranges of parathormone and mineral metabolism parameters recommended by KDOQI guidelines. This mandates the re-evaluation of current treatment of end-stage renal disease, along with the implementation of newer modalities of hemodialysis and secondary hyperparathyroidism treatment.

Keywords: Parathormone, mineral metabolism, cardiovascular disease, echocardiography, end-stage renal disease. Prince Rashed Hospital.

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Introduction

Secondary hyperparathyroidism (SHPTH) occurs in almost all patients with end stage renal disease (Stage 5) and appears to be a cause of increased morbidity in the dialysis population. Furthermore, secondary hyperparathyroidism is often observed early in the course of chronic kidney disease and progresses as renal function declines (1, 2).

In patients with chronic kidney failure (CRF), overproduction of parathormone occurs in response to a complex interplay of factors that include a deficiency of calcitriol, hyperphosphatemia, and skeletal resistance to PTH, all of which lead to hypocalcaemia. However, it may be difficult to identify specific causes in early kidney disease as the increased production of PTH serves to prevent hypocalcaemia, hyperphosphatemia, and a decrease in calcitriol (3). In this complex biological process, the overproduction of PTH develops as a compensatory response in order to control the mineral metabolism by acting on kidneys (4, 5, 6) and bones (7, 8), the targets of parathormone action.

However, inadequately controlled chronic mineral disturbances and consequently, chronic overproduction of PTH in CKD may be responsible for a wide spectrum of skeletal and non-skeletal abnormalities, such as renal osteodystrophy(9,10) , pulmonary(11) and systemic(12) hypertension(HTN), structural and functional cardiac diseases(13), severe vascular calcifications and other multiple systemic complications(14,15,16,17), thus leading to increased morbidity and mortality.

The above mentioned complications mandate the early and prompt management of SHPTH considering the pathways involved in the parathyroid gland activity. In this regard it has been generally recommended to reduce parathormone

level to within a range that supports normal bone turnover and minimize systemic complications. The Kidney Disease Outcome Quality Initiative (KDOQI) guidelines recommend that in ESRD the level of PTH, corrected calcium, phosphorus, and calcium x phosphorus product should be maintained at 150-300pg/ml, 8.4-9.5mg/dl, 3.5-5.5mg/dl and <55mg/dl, respectively (18). This may be achieved by a number of therapeutic modalities including dietary restriction of phosphate (19), modest oral calcium supplementation (20,21), calcium-based (22) and non-calcium-based (23) phosphate binders, vitamin D3 sterols (24,26), vitamin D3 and D2 analogues (24,27), and calcimimetic drugs. The latter drugs (calcimimetics) represent a novel approach in the management of SHPTH because their mechanism of action is different from that of vitamin D sterols, and it has been shown that they represent highly effective preparations in lowering PTH and phosphorus levels without inducing hypercalcemia (28-30). However, in some patients adequate control of serum phosphorus and PTH levels is difficult to achieve because of the limitations of current dialysis strategies. In this regard studies showed that alternative dialysis regimens, such as daily nocturnal and short duration HD done 6 days per week, provide a much better control of serum phosphorus than conventional HD (31).

However, some patients, may develop severe hyperparathyroidism (iPTH greater than >800pg/dl) and intractable systemic complications despite appropriate medical treatment. In such patients, parathyroidectomy may be necessary to control hyperparathyroidism and systemic complications (32).

Although much is known about the factors in renal failure that result in SHPTH; many questions regarding the PTH behavior in different population of CKD remain under evaluation. In this regard, studies showed that hemodialysis patients are not equally liable to develop SHPTH. Some studies demonstrated that DM in the setting of CKD is associated with lower levels of parathormone. On other hand duration of HD and age of patients, may significantly affect serum iPTH levels (33).

This study was conducted in order to assay the levels of parathormone in our HD patients; to recognize its association with some biochemical and cardiovascular indices, and to clarify the influence of some factors such as age, DM, and duration of HD on the levels of this hormone.

Subject and Methods

This is a retrospective study which was performed in patients undergoing chronic HD at PRH during August 2009 to August 2010.

Factors that served as exclusion criteria were cigarette smoking, recent myocardial infarction, and pericardial effusion shown by 2-D echo.

Demographic and clinical data regarding age, duration on HD, drug history, history of parathyroidectomy, DM, HTN, and smoking, were obtained from charts review and patients themselves.

All our study patients were on treatment for SHPTH with oral vitamin D3 sterols and calcium carbonate, both prescribed in different doses. Hemodialysis protocol at PRH was 3-4 hours, twice to thrice weekly.

Blood pressure readings were taken three times consecutively after 10 minutes of rest, at 2-minute intervals with one automatic blood pressure monitor, taking the mean of the three readings. Mean arterial pressure (MAP) was calculated using the formula: $MAP = 2/3 \text{ diastolic pressure} + 1/3 \text{ systolic pressure}$.

After an overnight fast, blood samples were obtained and serum iPTH was measured by the radioimmunoassay (RIA) method using DSL 8000 KITS of USA (normal range is 10 - 65 Pg/ml). Peripheral venous blood samples were also taken for serum creatinine, calcium, phosphorus, albumin, and hematocrit measurements, which were performed using standard kits. Corrected calcium and Ca x P product were calculated using appropriate formulas, and the biochemical data of the study was compared with the KDOQI guidelines for mineral metabolism.

All patients underwent 2-dimensional echocardiography (2D Echo) for the measurement of interventricular septal thickness (IVS), ejection fraction (EF), and pulmonary artery pressure (PAP). IVS between 6-11 mm and EF between 55% -75% were considered as normal. This test was performed the day after hemodialysis after achieving dry weight of the patients.

For statistical analysis, descriptive data were expressed as mean + standard deviation (SD) and as frequency distributions. ANOVA was used to evaluate the linear relationship between pairs of variables and t-test for the relationship between mean values. The regression results were expressed using the partial correlation coefficient (r). All statistical analyses were performed using SPSS. Statistical significance was set at p value <0.05.

Results

The total number of HD patients in our unit was 143. Of these 12 patients were excluded as they did not meet the requirements of the study, while the remaining 131 patients 76 (58%) males, 55 (42%) females who consisted of 64 (49%) diabetic and 67 (51%) non diabetic patients were included in the study [Table 1]. None of our patients had a history of parathyroidectomy.

The mean age of patients was 53.7 + 16.2 years, ranging from 15-89 years. The mean duration on HD was 3.9 + 4.6 years.

The mean serum iPTH was 541.5 + 617 pg/ml (range 9-2800pg/ml). The means of serum calcium and phosphorus were 8.6 + 0.91 and 6.6 + 1.4 mg/dl respectively. The mean of left ventricular (LV) EF was 59.7 + 6.7% and the mean of IVS was 1.2 + 0.4 mm (Table 1 - next page).

The present study revealed a statistically significant positive correlation between the level of iPTH and age ($r = +0.173$, $P = 0.04$), MAP ($r = +0.369$, $p = 0.00$), duration on HD

Patient's Data	Values
Number of study patients	131
Male / Female	76/55
Diabetic/non Diabetic	64/67
PTH (pg/ml)	
Mean	541 ± 617
Range	9 - 2800
Ca – (mg/dl)	8.6 ± 0.9
Phosphorus(mg/dl)	6.6 ± 104
L V. EF. (%)	59.7 ± 6.7
IVS(mm)	1.2 ± 4
AGE (yrs)	53.7 ± 16.2
MAP(mm Hg)	99 ± 135
PAP(mm Hg)	35.9±9.4

Table 1: Demographic and clinical data of patients

Patient's Data	KDOQI Data	Our Data	Percentage of our data accepted by KDOQI
PTH	150-300	9-2800	18.31%
Ca x P	< 55 mg 2/d2	30-80	30.4%
CA	8.2-10.2 mg/dl	6.2-10.4	37.4%
Phosphorus	3.5-5.5mg/dl	2.5-10.2	42.7%

Table 2: The study data compared to KDOQI guidelines regarding mineral metabolism

($r=+0.252$, $P=0.004$), IVS ($r=+0.223$, $P=0.01$) PAP ($r=+0.326$, $p=0.000$), Creatinine ($r=+0.17$, $P=0.044$), Phosphorus ($r=+0.280$, $p=0.003$) and Ca x P product($r=+0.226$, $p=0.02$).

On other hand calcium level and EF were inversely correlated to levels of iPTH, ($r=-0.393$, $P=0.00$) and ($r=-0.241$, $P=0.005$) respectively [Table 3 - opposite page].

Furthermore, this study showed that history of diabetes mellitus inversely affects iPTH levels being (380+300) in diabetic as compared to (738+ 900) in Non-diabetic patients, P value 0.02. However there was no significant difference between males and females regarding PTH level, p value 0.67. [Table 4].

Discussion

To our best knowledge, the HD population in Jordan was scarcely investigated for secondary hyperparathyroidism. The present study, therefore, was conducted in order to continue the national efforts and to preclude for further studies in this important aspect of care in patients with ESRD.

In this study we observed very high levels of parathormone and that calcium and phosphorus levels in most of our patients were away from the ranges recommended by KDOQI guidelines for mineral metabolism (18). These important data mandate an immediate reevaluation of CKD management in our HD unit, and particularly, the management of SHPTH. In this regard, the implementation of new therapeutic modalities, such as vitamin D2 analogues and calcimimetics (24, 27-30) may be some of the resolutions.

Patient's data	Pearson's correlation ®	P. Value
Age	+0.173	0.04
Calcium	-0.393	0.00
Phosphorus	+0.280	0.003
Creatinine	+0.176	0.04
IVS	+0.223	0.01
PAP	+0.326	0.000
Ejection Fraction	-0.241	0.005
Duration on HD	+0.252	0.004
MAP	+0.369	0.000
PCV	-0.054	0.54
Ca x P product	+0.226	0.02

Table 3: The significance of clinical data of the patients in correlation with iPTH levels

Patient's Data		PTH(pg/dl), mean±sd	P Value
Diabetes mellitus	Yes (n-64)	380±300	0.02
	No (n – 67)	738±900	
Gender	Male n-76	590±640	0.67
	Female n-55	520±590	

Table 4: The effect of gender and DM on iPTH level

Along with high levels of iPTH and phosphorus, in the present study we observed high levels of creatinine, in addition to significant positive correlation between PTH and creatinine levels. In this regard we believe that the introduction of newer modalities of HD regimens in selected patients is an additional step, potentially able to improve mineral metabolism, reduce parathormone levels, and, probably, decrease creatinine levels (31). The evaluation of these regimens in our dialysis units is needed.

On other hand, although in patients with a failing conservative treatment and very high PTH levels, parathyroidectomy must be considered (32); this procedure was not performed in any of our patients.

In our study we observed that serum calcium levels have a significant inverse correlation with iPTH levels, while those of phosphorus Ca x P product showed a strong positive correlation with the levels of this hormone. These data are in agreement with the data observed by other authors (14, 16) and are suggestive of the role of the abnormal mineral metabolism as an important factor in the pathogenesis

of secondary hyperparathyroidism in CKD, making the correction of mineral metabolism as essential in controlling SHPTH.

Among the principal findings of this study were significant positive correlations between serum iPTH and IVS, MAP, PAP, and inverse correlation between iPTH and EF. These data are concordant with many studies held worldwide (11-17) and suggest the secondary hyperparathyroidism as an important association with cardiovascular disease in HD patients. These data make the early and prompt treatment of secondary hyperparathyroidism as a measure which may serve for reduction of the risk of cardiovascular morbidity and mortality in dialysis patients.

In concordance with other studies (33), our study showed a significant difference between serum level of iPTH in diabetic and non diabetic HD patients, with lower values in the diabetic group. These data were supported by some experimental studies which confirmed the suppressive effect of DM on the parathyroid gland (33, 34).

An inverse correlation between age and serum parathyroid hormone in HD Patients was observed in several studies (35), however some studies including ours, have demonstrated an age-related increase in PTH (36). These differences may be attributed to some factors such as duration on HD and differences in HD regimens.

Finally, we believe that the failure of our HD unit to achieve the recommended range by KDOQI mineral and iPTH levels, is multifactorial. Firstly, calcium carbonate and vitamin D3 sterols are the mainstay treatment used for SHPTH, while the newer, more effective drugs, such as calcimimetics and vitamin D2 analogues are still not in use. Secondly, the conventional regimens of HD, used in our unit, may be responsible for this failure. Thirdly, parathyroidectomy was not performed in any of our patients with severe hyperparathyroidism, the aspect which is contrary to KDOQI recommendations.

Conclusion

Along with the significant correlation of iPTH levels with mineral imbalance and cardiovascular abnormalities, very high levels of iPTH were observed in our study population. This mandates an immediate revision of the management of CKD in general and SHPTH in particular.

Further multicenter and multidisciplinary studies of SHPTH and its correlates are mandatory in the Jordanian HD population.

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Positive blood culture and Antibiotic susceptibility in young infants, admitted to Prince Hashim Hospital, suspecting sepsis

Abstract

Aim: To determine the most common pathogen causing sepsis in young infants aged from birth to 2 months admitted to Prince Hashim Hospital in Al Zarqaa city and to identify the antibiotic sensitivity patterns of isolates from their blood cultures.

Material and Methods: A retrospective study of cases aged (birth - 2 months), admitted to Prince Hashim Hospital and suspected to have clinical sepsis, during the period between March 2007 - March 2008. Their blood culture reports were reviewed, and their antibiotic sensitivity was also analyzed.

Results: Out of 700 cases that were admitted to Prince Hashim hospital:

Positive blood cultures were seen in 175 (25%) cases.

All positive blood cultures were caused by a single pathogen.

- Coagulase negative staph (CONS) seen in 70 cases.
- Staph aureus seen in 50 cases
- Klebsiella species seen in 25 cases.

The majority of infants were sensitive to a combination of third generation cephalosporin and aminoglycoside (Amikacin, Gentamycin).

Conclusions: Coagulase negative staph (CONS), staph aureus, and klebsiella are species responsible for the majority of isolates causing sepsis.

A combination of third generation cephalosporin and aminoglycoside should be the first choice of treatment.

Key words: blood culture, coagulase negative staph (CONS), sepsis.

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Introduction

Neonatal sepsis is estimated to cause 1.6 millions deaths every year globally; 40% of all neonatal deaths occur in developing countries (1,2). The susceptibility of the neonate to sepsis is multifactorial and can be related to immaturity in humoral, phagocytic or cellular immunity, hypoxia, acidosis or metabolic derangements.

Group B streptococcal disease is the most important cause of neonatal sepsis in Europe and North America(3), but there is a preponderance of gram negative organisms in tropical and developing countries(4). The early identification of sepsis in infants is difficult because early symptoms of sepsis are non specific (5).

Bacterial colonization doesn't always result in disease, Factors influencing which colonized infant will develop disease are not well understood but include prematurity underlying illness, invasive procedure, inoculum size, virulence of the infecting organisms, innate immune systems, host response and transplacental maternal antibodies (6).

Classification of neonatal sepsis is useful as it facilitates consideration of common principles of causations, presentation and treatment(7). There are two patterns of septicaemia described during the first month of life, early-onset (EOS) and late onset (LOS) (8). Others are also described as late - late onset sepsis after one month of life (6).

(EOS) disease presents as fulminant multi system illness during the first 5-7 days of life . Whereas LOS is most commonly present after the first week of life (9).

(EOS) is commonly caused by microorganisms acquired from the mother before or during birth (7), while bacteria responsible for late onset sepsis includes those acquired from

Clinical features	Total (n=175)	
	N	%
Poor feeding	70	40%
Fever	50	29%
Hypothermia	10	5%
Vomiting	15	8%
Convulsion	25	14%
Respiratory distress	22	12%
Lethargy	43	25%
Jaundice	35	20%
Irritability	10	5%

Table 1: Clinical features in a babies with proved sepsis

Pathogen	Total (n=175)	
	n	%
CONS	70	40%
Staph aureus	50	29%
Klebsiella	25	14.5%
E.Coli	3	2%
Streptococcus species	5	3%
Bacillus	1	1%
Enterobacter species	8	5.5%
Enterococcus	5	3%
Candida	3	5%
Acinetobacter	5	3%

Table 2: Pathogen isolated from the blood

the maternal genital canal and organisms acquired after birth from human contacts or from contaminated equipment or material (10).

Blood culture remains the mainstay of investigation in potential sepsis in infants and children, despite recent advances in the molecular diagnosis of bacterial and fungal sepsis (11). This study was conducted to determine the most common micro-organisms causing sepsis in this age group and their antibiotic susceptibility pattern in Prince Hashim hospital.

This retrospective study includes 700 cases of clinically suspected sepsis admitted to Prince Hashim hospital which is situated in Zarqaa city in the Eastern region of Jordan, either to the pediatric ward or to the neonatal division, during the period of March 2007 to March 2008.

Those who were admitted to the neonatal division include:

1. All newborns of mothers with maternal fever or prolonged rupture of membrane (> 18 hours) or foul smelling or meconium stained liquor.
2. Those who were delivered prematurely or with birth asphyxia needing active resuscitation.
3. Those who had undergone exchange transfusions.
4. Those with signs and symptoms of sepsis (Table 1).

Those who were admitted to the pediatric ward were referred either from the emergency department or from the clinic having signs and symptoms of sepsis (Table 1). Blood samples were collected in all cases for cultured sensitivity studies. Blood culture reports were reviewed and those with positive blood culture were studied and their antibiotic sensitivity patterns were also evaluated.

Results

A total of 700 patients suspected of having clinical sepsis admitted to Prince Hashim hospital. Positive blood culture reports were seen in 175 (25%) cases, 120 cases were male, 55 cases were female. Male: female ratio 2.2: 1

25 cases (14%) were (EOS), babies less than one week of life .

70 cases (40%) were (LOS) after first week of life.

80 cases (46%) were (LLOS) after the first month of life.

Discussion

In developing countries, rates of blood stream infections (BSI) have been reported to be 1.7-33/100 live births, with rates in Asia clustering around 15/1000 live births (12). The major problem in neonatal infection is the identification of the infected infant and the equally important task of identifying the non-infected infant(13). Many babies are treated with several days of antibiotic because of possible infection while waiting for negative bacteriologic culture.

It is standard clinical practise to discontinue antibiotic treatment in an asymptomatic infant if the blood cultures are negative at 48 -72 hours (14). In this study, blood culture positivity rate is 25% whereas in 75% of cases there was no growth. This finding is comparable with other reports (15,16). The low blood culture isolation rate could be due to antibiotic usage before taking blood culture, or possible anaerobe infection, because negative blood cultures don't exclude sepsis and about 26% of neonatal sepsis could be due to anaerobes (17).

Males have been reported to be 2 to 5 times more likely than females to develop sepsis(18). The male to female ratio in our study is 2.2:1 which is comparable with the above study.

CONS, staph aureus are the predominate pathogen isolated which is in agreement with the other reports(19,20).

Latin America, South East Asia and the Middle East have reported high rates of CONS infections which might indicate high rate of invasive device use (12) or represent simple contaminations.

Staph aureus colonizes the skin, nasopharynx, gastrointestinal tract and spreads via the hands of health care worker(21).

In this study, klebsiella species (25%) and enterobacter species (8%) are the leading cause of neonatal sepsis among gram negative species.

The report of the national neonatal-perinatal database showed klebsiella as the predominant pathogen (29%) (22).

The majority of the pathogens isolated were sensitive to a combination of third generation cephalosporin and aminoglycosides. This supports the use of these antibiotics as the first line of empiric treatment of sepsis, and also supports WHO recommendations that management of young infants up to the age of 2 months include parenteral use of benzyl penicillin or ampicillin plus an aminoglycoside such as gentamycin (23).

Conclusion

CONS, staph aureus, gram negative organism (klebsiella, enterobacter) causes the majority of neonatal sepsis in Prince Hashim hospital.

Most of these pathogens were sensitive to third generation cephalosporins and aminoglycoside.

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Early detection of bacterial sepsis in newborns admitted to neonatal intensive care unit

Abstract

Objective: Neonatal infections are by far the most common cause of morbidity and mortality in infancy.

The aim of our study was to determine the usefulness of Interleukin-6 level and positivity of blood culture in the neonatal intensive care unit, with suspicion of bacterial infection.

Methods: This retrospective study was conducted over a period of two years 2009-2010 and data collected using patients' files at Pediatric and Neonatal care unit of "Carl Gustav Carus" Technical University Hospital, Dresden, Germany, where we reviewed 778 files of different age groups of newborns from 28 to 42 week's gestational age. We compared the positive bacterial blood culture result with inflammatory markers, i.e interleukin-6 (IL-6) and C-reactive protein (CRP). Blood samples were collected at the time of admission and before the first antibiotic dose, for complete blood count, blood culture, and interleukin-6 (IL-6), C-reactive protein (CRP) estimates were done.

Result: Of the 73 blood samples clinically having suspicion of sepsis, there were twenty two samples that revealed positive blood cultures for bacteria. The level of interleukin in the first hour was extremely high and normal or minimal elevation in C- reactive protein. The whole group median IL-6 was 100 pg/ml. High level groups (IL-6 > 1000 pg/ml) were formed by 17 Newborns and the low level group (IL-6 < 350 pg/ml) by 5 newborns and CRP maximum level was 12 mg/l in eight patients.

Conclusions: Based on our results, high levels of IL-6 are more useful than CRP for detection of infection and positive blood culture especially within the time of admission to neonatal intensive care. We conclude that high IL-6 plasma level measurement might correlate with positive bacterial blood culture in neonatal sepsis.

Keywords: C-reactive Protein; Interleukin-6 ; Sepsis

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Introduction

Neonatal sepsis refers to a systemic infection with positive blood or other central culture. Sepsis occurs when bacteria infect the bloodstream of the "immunologically compromised" newborn host. Clinical diagnosis of sepsis in newborn infants is not easy because symptoms and signs are non-specific. There is no laboratory test with 100% specificity and sensitivity, to detect bacteraemia in the neonate but the search has continued for a reliable test. The neonates with "risk factors" for neonatal sepsis are thus treated with broad spectrum antibiotics and require prolonged hospitalization [1]. Mortality has decreased in recent years for term, low-birth weight, and very-low-birth weight infants, possibly due to the shift in predominant organisms from gram-negative to gram-positive [2]. Blood cultures are the gold standard for diagnosis of sepsis; however, the results of the test are available only after 48-72 hours. The positivity rates vary widely, ranging from 30 to 87%. [3]. Interleukin-6 is a rapid-response inflammatory protein with a short plasma half-life. [4]. The proinflammatory cytokine interleukin-6 consist of a series of phosphoglycoproteins with a molecular weight ranging from 21 to 45 kDa and the serum reference limit of IL-6 is less than 10 pg/ml in healthy individuals [5-6]. In response to inflammatory tissue injury, IL-6 is a mediator of the acute phase response. Previous clinical studies demonstrated consistently elevated IL-6 level in patients with sepsis, and that IL-6 levels above 1000 pg/ml are generally associated with an increased mortality rate in critically ill patients [7-11]. Undetectable concentrations may be measured in septic neonates at the time of suspected infection onset because the interleukin-6 concentration has already returned to baseline.

By contrast, C-reactive protein, an acute phase protein stimulated by interleukin-6 rises to abnormal concentrations in neonates 24-48 hours after the onset of infection, a time when interleukin-6 concentrations may have already fallen to within the normal range. Levels of C-reactive protein (CRP), an acute phase protein associated with tissue injury,

injury, are elevated at some point in 50-90% of infants with systemic bacterial infections [12]. Moreover, CRP is also reported to elevate in non-infectious conditions like meconium aspiration, birth asphyxia and tissue injury [13-15]. The positive predictive value of CRP for neonatal septicemia is reported to be <50% [16]. So the value of CRP in sepsis workup is questionable. Therefore, the combination of interleukin-6 an early marker of infection, with C-reactive protein (CRP), a later sepsis marker, may allow the clinician to monitor the evolution of neonatal infection and detect more accurately infection among neonates. An early detection of infections among neonates will allow better planning for medical treatment and preventing further physiological damage due to infection. This study intends to measure both markers, although interleukin is more accurate in early diagnosis bacterial sepsis in neonatal critical care units. Studies that have measured interleukin-6 and CRP together, show that the combination is more sensitive than either marker alone, with little change in the specificity, and hence few false-positive results. [17-18]. Therefore, the purpose of this study was to evaluate the high level of IL-6 in early detection of positive bacterial blood culture in the first hour of newborn admission with clinical sepsis, to the intensive care unit.

Methods

Design

This study used the retrospective approach to review medical records for newborns who were admitted to the intensive care unit of Carl Gustav Carus University hospital in Dresden, Germany, between January 2009 and December 2010.

Sample and setting

A total of 778 newborns represented the total number of newborns in the PICU over the two year period. Data was collected in regards to documentation of blood culture results and interleukin-6 and C- reactive protein tests. Among these there were 73 newborns suspected for septicaemia, and 22 had positive blood culture for bacteria. For the purpose of the study, all newborns who presented with positive signs and symptoms of septicemia with/without pneumonia and/or meningitis had been investigated retrospectively. Neonates were excluded from our study if they had: a) major congenital anomaly; b) inborn errors of metabolism, c) hemolytic jaundice or respiratory distress syndrome (due to surfactant deficiency). Informed consent was obtained from the parents of each newborn, in the file of each newborn, at time of admission.

Data collection

Medical records reviewed maturity, age at onset, sex, birth weight, symptoms and signs along with the maternal risk factors. The cases with suspect sepsis were screened for interleukin-6, C-reactive protein, and blood culture. Other investigations were done previously as required. Some of these neonates were asymptomatic but were evaluated for sepsis because of maternal intrapartum sepsis risk factors like prolonged rupture of membranes, maternal urinary tract infection, maternal intrapartum fever >38°C, chorioamnionitis, and excessive vaginal discharge. The

criterion standard for diagnosing sepsis is the positive organism-specific blood culture, at least in the absence of maternal intrapartum antibiotic prophylaxis. Laboratory test for blood culture, Interleukin-6 and C-reactive protein were obtained from peripheral or umbilical vein for every newborn admitted to the critical care unit for routine culture of aerobic and anaerobic bacteria. Cultures of cerebrospinal fluid and urine were performed when appropriate. In addition, tracheal samples from intubated patients were cultured for bacteriology and screening for IgM antibodies to Toxoplasma, rubella virus, cytomegalovirus, herpes simplex virus, and Treponema pallidum was done in the first few postnatal days if congenital infection seemed likely. We evaluated demographic characters, blood culture results and IL-6 with CRP levels of patients, and then we compared results of interleukin-6 and C-reactive protein with positive blood culture for bacteria. We defined clinical sepsis according to the presence of the following parameters on clinical, laboratory or cultural screen [18-19]: Clinical signs consistent with infection (at least two from the following categories): Table (1) - next page.

Result

A total of 778 newborns who were screened retrospectively represented all hospitalized neonates in critical care. Of these 254 (32.6%) were full term (>37 gestational age) and 524 (67.4%) preterm (>28week gestational age). Among the total number of newborns, 73 (9.4%) newborn met the inclusion criteria. Twenty two (30%) of newborns had positive and 51(70%) negative blood culture.

Of newborns suspected of neonatal sepsis with negative blood culture and negative CRP, three had a slight elevation level of IL-6. Moreover, the statistical analysis showed no significant difference in regards to gender and gestational age of both groups ($p > .05$). In addition, for those 22 newborns diagnosed with sepsis, the mean IL-6 was 100 pg/ml. High level groups (IL-6 > 1000 pg/ml) was formed by 17 newborns, and low level group (IL-6 < 350 pg/ml) by 5 newborns and CRP maximum level was 12 mg/l in eight newborns.

As shown in Table 2 (next page), the analysis showed that the most common isolate microorganism from blood culture was *E.coli* ($n = 7$, 9.5%) patients, and the least common was *Klebsiella* spp., with two (2.7%) patients in all the newborn with bacterial sepsis. IL-6 plasma levels were significantly elevated at the time of first blood sample which was more than 30000pg/ml and were consistent with positive bacterial sepsis mainly gram negative bacteria. Moreover, the analysis showed that there was no significant correlation between gestational age ($r = 0.24$; $P > 0.05$) and gender ($r = 0.27$; $p > 0.05$) and the IL-6 plasma level among newborns with positive blood culture. In addition, Serum IL-6 levels were higher in neonates with positive blood culture especially in gram negative bacteria compared to coagulase negative staphylococcus than in the non-infected neonates and those with negative blood culture ($p < 0.001$ and $p < 0.01$, respectively). The level of CRP in the first hour of admission was not significantly elevated. As in Table 3 (next page) the level of IL-6 was 20000 and 45000pg/ml in gram negative

Respiratory	Tachypnea (respiratory rate >60 bpm, in full term newborn and >70 bpm in preterm baby). Subcostal and/or intercostals retractions, grunting, apnea >20seconds.
Cardiovascular	Poor perfusion, capillary refill >3 s, metabolic acidosis with pH <7.25, tachycardia >170 bpm, bradycardia <90 bpm, hypotension with blood pressure < 2 SD of the mean for age and weight
Neurologic	Hypotonic, lethargy, convulsions.
Gastrointestinal	Vomiting, rejection of food, abdominal distention, hepatomegaly, poor peripheral perfusion.
Temperature	Hypothermia <36 °C, hyperthermia >37.9 °C);

Table 1: Clinical signs of neonatal sepsis

Microorganism	Frequency	%
No microorganism	51	70%
E. coli	7	9.5%
Coagulase Neg. Staph	5	6.8%
Streptococcus pneumonia	4	5.5%
Pseudomonas aeruginosa	4	5.5%
Klebsiella spp.	2	2.7%
Total	73	100%

Table 2: Most common isolate microorganism from blood culture in 73 infants with clinical suspected sepsis (left)

Table 3: Levels of interleukin-6 (IL-6) and C-reactive protein (CRP) in 73 infants with clinical suspected sepsis (below)

Variable	IL-6 (pg/ml) <50pg/ml	CRP (mg/l) <5mg/l
Blood culture positive (E. coli., Streptococcus pneumonia, Pseudomonas aeruginosa, Klebsiella.)	1,200-50,000	5-22
Coagulase Neg. Staph.	200-1000	1-5
Blood culture negative negative<1	10-100	

bacteria especially *E. Coli* and *Pseudomonas*; also it was seen in *Strep. Pneumonia* but in *staphylococcus* the level of interleukin-6 was not significantly elevated. It reached a maximum of 1000pg/ml, and when the level of IL-6 is less than 50pg/ml the culture is negative in all.

Discussion

This retrospective clinical study was undertaken to identify a serum biomarker panel to diagnose bacterial sepsis in newborn admitted to the neonatal critical care unit. It has been found that IL-6 was reacting with maximum plasma concentrations at the time when the infants were suspected of having sepsis. CRP were late reacting with maximum concentrations at 24 hours; we especially noted that when the cytokine values were decreasing, CRP had just started to increase. Early recognition of neonatal sepsis and prompt initiation of appropriate antibiotic therapy is essential for the successful treatment of bacterial infections in the neonatal period. Clinical symptoms and signs of neonatal sepsis can be very non-specific and, therefore, easily misleading. The major problem in neonatal infections is the identification of the infected infant and the equally important task of identifying the non-infected infant [19]. The incidence of sepsis in neonatal intensive care units (NICU) is high due to immature management of patients' needs, and consequently, another confounding factor is the potential transplacental transfer of antibiotics administered to mothers during the pre- and intrapartum period which might increase the likelihood of culture-negative sepsis [20-21]. It is in this group of patients that the availability of a test that rapidly and reliably identified the presence of sepsis would be immensely valuable. Such a test would radically alter neonatal prescribing practices and limit the unnecessary administration of antibiotics to uninfected infants. That is the reason our study excluded all newborns whose mother received antibiotics before delivery.

Many newborn are treated with several days of antibiotics because of possible infection while waiting for negative bacteriologic cultures. In our retrospective chart reviews we found that IL6 is an important cytokine of the early host response to infection. Its concentration increases sharply after exposure to bacterial products and precedes the increase in CRP. Many studies have tried to find reliable early reacting cytokines for detection of bacterial sepsis in the neonatal period [22]. Evaluation of possible infection is sometimes extremely difficult in neonatal bacterial sepsis. Therefore antibiotics may be used more often than necessary in the NICU, which increases the risk of antibiotic resistance [23]. The aim of the retrospective study was to analyse the dynamic markers during the time of admission after the suspicion of sepsis, and on the basis of the results to test how well a combination of an early high level of interleukin-6 correlated with positive culture for bacteria, mainly gram negative. The inflammatory process in sepsis is biochemically very complex. From laboratory and clinical studies it is known that some pro-inflammatory cytokines peak very fast, within one to four hours after a sepsis stimulus [22-25].

C-reactive protein (CRP) rises to a maximum 24 hours after the septic stimulus [26]. CRP is induced by pro-inflammatory cytokines [27]. In our retrospective chart reviews we evaluate

the level of C-reactive protein compared with interleukin-6 in detection of early bacterial infection in the neonate, and it showed that IL-6 concentrations are significantly elevated in neonates with bacterial infections during the time of admission to NICU compared with those of septic neonates with negative blood culture. In other study it was maintained that umbilical cord blood IL6 has been consistently shown to be a sensitive marker for diagnosing neonatal infection within 72 hours of birth; the sensitivities and negative predictive values being 87-100% and 93-100 %. [28-30]. We hypothesize that IL-6 appears to be a highly sensitive marker of sepsis in the immediate postnatal period. This high sensitivity for early onset-sepsis is related to its rapid response time, which is much faster than that of CRP and thus should help to gain time for diagnosis of sepsis. Our studies demonstrate very high serum interleukin-6 levels in all neonates with proven or clinically diagnosed bacterial infection. Neonates with viral infection, bacterial colonization, or respiratory distress of numerous causes, including hypoxemia, had normal or only slightly increased serum interleukin-6 levels.

In summary, we have the conviction that measurement of interleukin-6 alone would be sufficiently sensitive to diagnose bacterial infection in the neonatal critical care unit. Using sensitivity of interleukin-6 can give a guide to making a better decision to treat those with positive reports using antibiotics.

Conclusion

This study provides evidence that IL-6 is a better diagnostic marker of neonatal sepsis at the time of admission to critical care units, with suspicion of sepsis. The study revealed that interleukin-6 measurements may be of value in the early diagnosis of neonatal bacterial infection, however, CRP measured at the time of admission did not discriminate neonate with culture-proven sepsis from uninfected neonates. Although Interleukin-6 alone is not sufficiently sensitive to make a diagnosis of neonatal infection; it can help to detect positive bacterial culture in septic neonatal admission.

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The role of *Chlamydia pneumoniae* and respiratory syncytial virus in acute lower respiratory tract infections, in hospitalized under 2 year old children: A study from Iraq

ABSTRACT

Background: Lower respiratory tract infections are a common cause of morbidity and mortality in developing countries, including Iraq.

Aim: to study certain demographic data of <2 year aged patients, admitted with Lower Respiratory Tract Infection and trying to correlate them with seropositivity to *Chlamydia pneumoniae* (CP) and Respiratory Syncytial Virus (RSV).

Patients and methods: Between December 2009 and March 2010 infants and children under 2 years admitted to Al-Kadmia Teaching Hospital - with Acute Lower Respiratory Tract Infection (ALRI) were prospectively studied.

Full history and physical examination, radiological analysis, and basic laboratory examinations were performed including WBC and differential count, CRP, ELIZA for IgM antibodies for both CP and RSV were done for all the patients.

Results: A total of 86 patients under 2 years, 62 males and 24 females, were included. CP infection was detected in 44%, RSV infection in 16%, combined infection of both in 35%, and negative results of both in 5%.

Thirty patients had conjunctivitis, 28 of them were positive for CP, while only 1 had RSV infection.

Eighty five percent of the patients presented with wheezy chest, 15% had features of consolidation, (10/12) had CP infection; regarding chest X-Ray findings 11 patients had lobar pneumonia, 10 of them were positive for CP infection. CRP was positive in 18 patients, 17 of them were seropositive for CP either alone or in combination with RSV, but no patient with RSV alone had a positive CRP.

WBC differential count shows that lymphocytosis is more common in patients with RSV infection (64%), while neutrophilia was more common in those with CP infection (32%).

Conclusion: Our study shows that CP and RSV are both common causes of LRTI, but CP may show clinical and laboratory findings of pneumonic consolidation.

Key words: acute lower respiratory tract infection *Chlamydia pneumoniae* RSV under 2 years

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Introduction

Both pneumonia and bronchiolitis are common and potentially serious infections that afflict infants and children throughout the world, but it is very difficult to distinguish between them especially in small infants, because the features of these two diseases often overlap(1,2). The World Health Organization has defined pneumonia solely on the basis of clinical findings obtained by visual inspection and timing of the respiratory rate.(3)

An acute lower respiratory tract infection (ALRI) is a leading cause of morbidity and mortality amongst children in developing countries(4). In these countries, it causes 19% of all deaths among children younger than 5 years and 8.2% of all disability(5). Of children treated at a general hospital 40-60% suffered from acute lower respiratory tract infection (ALRI), and about 10% of them require hospitalization(6).

Patients and Methods

In this study we investigated 86 patients under 2 years of age, who were admitted to Al-Kathemya teaching hospital, Baghdad, in the period between 1st of December 2009 to the 1st of March 2010, under the diagnosis of acute lower respiratory tract infection. Selection of patients was done according to the agreement of the attending physician and family, and from patients who were intended to have some blood sampling for the assessment of their condition.

History and physical examination were fully recorded on all the patients, then blood samples were collected and chest X-Ray was done to all. Three blood samples were collected for each patient, one for CRP, the second for WBC and differential count and the third was centrifuged and the serum was frozen and after collection of all the samples

they were sent to the Teaching laboratories in Medical City Teaching Hospital, and these were tested for IgM for both Chlamydia Pneumoniae and Respiratory Syncytial Virus (RSV) by ELIZA (kits used were ATLAS MEDICAL KIT).

According to the clinical presentations, patients were assigned as having clinical features of pneumonic consolidation (in the presence of fine crepitations± bronchial breathing sounds) or as lower respiratory tract obstruction (wheezy chest).

X-Ray films were analyzed by the same examiner; they were categorized as: those with hyperinflation, those with pneumonic infiltrates (either lobar or bronchopneumonic), and X-ray films were analyzed by the same examiner.

Statistical analysis was carried out using case series study with pie charts.

Results

In the period between December 2009 and March 2010, eighty six patients younger than 2 years, admitted to Al-Kathemya teaching hospital with the diagnosis of acute lower respiratory tract infection (ALRI), were selected and prospectively studied. Males were 62(72%), with male: female ratio of 5:2. Most of the admitted patients were between 1-6 months of age 57(67%), while 21(24%) were below 1 month, and 8(9%) were above 6 months.

Chlamydia Pneumoniae (CP) IgM antibody was detected in 38(44%), RSV IgM antibody was detected in 14(16%), combined IgM seropositivity for both Chlamydia and RSV was detected in 30(35%) while only 4(5%) were negative for both pathogens, as shown in Figure 1.

Seventy four(85%) of patients had wheezy chest on physical examination, while 12(15%) presented with signs of consolidation. Chlamydia either alone or in combination with RSV was detected in 85% of those with features of consolidation, while the wheezy group reacted positively to one or both of the pathogens, and only 4(5%) of the wheezers reacted negatively for both organisms. This is shown in Table 1 - opposite page.

Regarding Chest X-Ray changes, of those with consolidation pattern (lobar or bronchopneumonic infiltrates) 19/23 (82.6%) were seropositive for Chlamydia either alone or in combination with RSV, two were seronegative for both, and for purely RSV positive cases only 2 had bronchopneumonic infiltrates and no-one had lobar pneumonia. Most of the cases demonstrated a picture of hyperinflation on CXR 63/86 (72%), and their serological reaction was distributed between the various pathogens. This is shown in Table 2.

As for the leukocyte reaction, Figure 2 (page 20) shows that 64% of cases reacting purely to RSV had evident lymphocytosis, and 58% of those purely reacting to Chlamydia, while lymphocytosis was shown in 25% of the negative reactors.

CRP was positive in 9 of those patients with Chlamydial infection and 8 of those with combined infection, but none of those patients with RSV infection showed a positive CRP.

Thirty patients(35%) had conjunctivitis, 28(32% of the total) of those with conjunctivitis had either Chlamydial infection or combined infection of both CP and RSV, while one(1%) only had RSV infection and another one (1%) had neither Chlamydial nor RSV infection; this is shown in Table 3.

Treatment : All the patients received different types of broad spectrum antibiotics (ampicillin, ceftriaxone, cefotaxime, azithromycin and in some patients with poor response to these antibiotics vancomycin was used), and seventy two (84%) of patients were treated with bronchodilators with or without steroid.

Discussion

A large number of micro-organisms can cause ALRI in infants and children. Determining the causative agent of an individual case may be difficult, because the lung is rarely sampled and sputum representing lower airway secretions can rarely be obtained from children, while culture of nasopharyngeal secretions is time consuming because it needs tissue culture(7). We chose to detect RSV and Chlamydia pneumoniae in serum by ELIZA for specific IgM antibody for each of them.

Most of our patients with ALRI were between 1-6 months and males were affected more than females This male predominance and clustering of ALRIs in <6 month old babies was documented in many other studies.(8,9)

A study in Taiwan showed that 30% of patients had Chlamydia trachomatis as the causative agent in hospitalized infants with ALRI (8); in the United States 30-35% of pneumonia in the first 4 months of life is attributed to Chlamydia trachomatis.(9) Another study was done on Argentinean children aged 18 months with ALRI. 19% of them had Chlamydia trachomatis as a causative agent(10).

Although studies have shown Chlamydia pneumoniae as a common cause of ALRI at preschool age and Chlamydia trachomatis as a common cause of pneumonia in the first 6 months of age(8,11), most of our patients responded (79%) positively to Chlamydia pneumoniae antibody. This may indicate the possibility that Chlamydia pneumoniae can cause ALRI in the younger age group too.

While CP sero-prevalence worldwide is estimated to be 50% in adults, with a sharp increase in children at preschool age, followed by a life-long increase due to reinfection(12), studies from high income countries generally describe low sero-prevalence in children aged 18-24 month(13,14).

Whereas studies from Taiwan, Korea, Congo and Sudan suggest that C pneumonia sero-prevalence in low-income countries may be higher(15,16,17). Agergaard et al (Guinea Bissau), found that the Chlamydia pneumoniae IgG

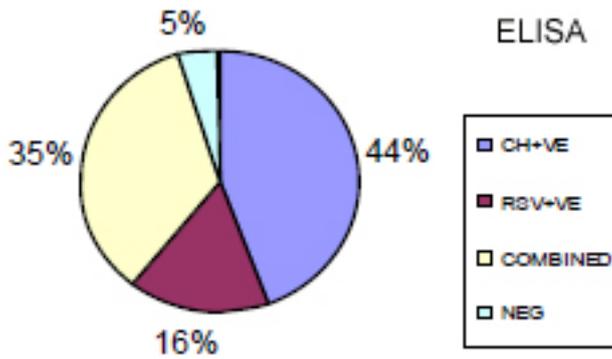


Figure 1: Serological reactions in patients with LRTI

	CH+VE		RSV+VE		COMBINED		NEG		TOTAL
	No.	%	No.	%	No.	%	No.	%	
Pneumonia	7	58%	2	17%	3	25%	0	0%	12 (100%)
Wheeze	33	45%	12	16%	25	34%	4	5%	74 (100%)

Table 1: Clinical presentation of patients with ALRI and their serological reactions

	CH+VE		RSV+VE		COMBINED		NEGATIVE		TOTAL
	No.	%	No.	%	No.	%	No.	%	
Hyperinfiltration	27	43%	13	21%	21	33%	2	3%	63 (100%)
Pneumonic infiltrates (lobar and bronchopneumonic)	9	39.1%	2	8.7%	10	43.5%	2	8.7%	23 (100%)

Table 2: Chest X-ray findings in patients with LRTI and their serological reactions

	CH+VE		RSV+VE		COMBINED		NEG		Total
	No.	%	No.	%	No.	%	No.	%	
No	24	28%	13	15%	16	19%	3	3%	56(100%)
Yes	14	16%	1	1%	14	16%	1	1%	30(100%)

Table 3: Presence of conjunctivitis according to seropositivity

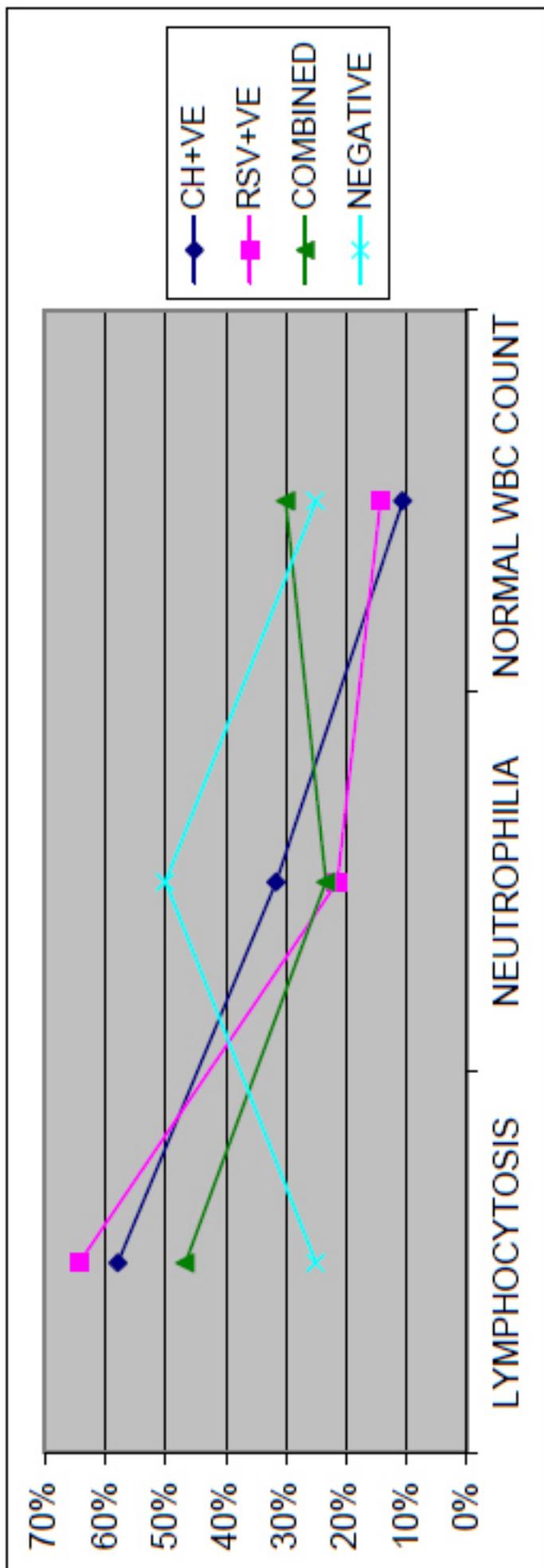


Figure 2: Leucocyte reaction according to serological reactivity

sero-prevalence was 12% at 18 months and increases to 16% at 24 months, among asymptomatic infants attending for immunization.(18)

Another probability is there is a cross reactivity between antigens of both types of Chlamydia, a problem that has been appreciated for a long time with variable sensitivities between different Chlamydia serological detection tests.(19,20,21,22,23)

RSV was found in nearly half of our patients whether alone or in combination with Chlamydia Pneumoniae and this level is near to that of other studies (6,9) where RSV was found in about 22-55% of patients with ALRI depending on the methods used for diagnosis.

Associated conjunctivitis was a common finding in our studied patients with Chlamydia infection, but very rare with RSV infection, this is a similar finding to other studies done in Taiwan and Rotterdam(8,10).

It is well known that both RSV and Chlamydia infection of the lower respiratory tract are common causes of wheezy chest(8,9,10) and similar results are obtained from our study (85%). Those with signs of consolidation, 10/12 of them were sero-positive for Chlamydia Pneumoniae; added to this, the radiological findings obtained showed that lobar infiltration is frequently associated with Chlamydia infection but rarely associated with RSV infections of lower respiratory tract. Many studies show chlamydial lower respiratory tract infection is associated with diffuse interstitial infiltration consistent with pneumonia(8).

Broad spectrum antibiotics were offered to all admitted patients with ALRI; additional erythromycin was used in only a small number of cases. It is evident that there was a great misuse of antibiotics; in a study in Italy (2001), 92% of hospitalized children for community acquired LRTI were covered with antimicrobials (24). International efforts have been made for a long time to urge pediatricians and family education towards proper use of antibiotics, to contain costs and limit the risk of resistant bacteria.

In conclusion, babies <2 years of age hospitalized for lower respiratory tract infection, being mostly wheezers, were largely seropositive for either Chlamydia pneumoniae or RSV (alone or in combination). In the presence of conjunctivitis, there was a lymphocytic reaction on blood film with a normal CRP; the likelihood of having a chlamydial infection should be intensely verified. While in the presence of the above findings and features suggestive of pneumonic consolidation physically or on X-ray, the likelihood of having a chlamydial infection was heightened over possible viral agents. It is time to revise the need for the overall application of antibiotic therapy for such children, and to revise the selection of antibiotics when needed (considering the need for Anti-chlamydia agents).

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Evaluation of the Dermatology Teaching Program in Tikrit University College Of Medicine [TUCOM]

I. Introduction

Evaluation is one of the essential elements of the educational process. Program evaluation has been described as the efforts to determine whether program objectives have been reached and the gathering of information to assess the efficiency of a program. In a more comprehensive context, program evaluation is described as the act of collecting systematic information on the nature and quality of educational objectives [1].

II. Steps in Program Evaluation

The framework composed of 6 steps that must be taken in any evaluation, it is a practical, non-prescriptive tool, designed to summarize and organize essential elements of program evaluation [2, 3].

Step 1- Engaging Stakeholders; Step 2- Describe the Program; Step 3- Focus the Evaluation design; Step 4- Gather credible evidence; Step 5- Justify conclusion; Step 6- Ensure use of shared lessons learned.

2.1. Engaging stakeholders

The program evaluation stakeholders include: Program Manager and Staff; College administration; Medical Education Department Staff; Examination committee; Head Department of Medicine; Head of Dermatology Section; Heads Departments of Pathology, Pharmacology and Pediatrics; University representative; Ministry of Health; Regional Health Authority; Local Government; Community Organizations; Religious Organizations; Student representatives; Regional Education Authority; and Iraqi Education Association.

2.2. Program Description

2.2.1. Program Title: Dermatology Teaching Program in TUCOM.

2.2.2. Goals:

Provides high quality medicinal education in the field of dermatology to develop a physician who is capable to deal with patients' health problem efficiently, effectively and ethically; also to share in solving community health problems by providing high standards of medical care or targeted research programs.

2.2.3. Objectives:

A To produce medical graduates educated on a board basics to enable them for further training, learning and practice in the dermatology specialty.

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- B** To graduate competent physicians who are able to practice dermatology safely, ethically and effectively.
 - C** To ensure that the acquired knowledge of the graduate is to be firmly based on scientific principles and graduates should develop appropriate learning and clinical skills in addition to professional attitudes.
 - D** To train students to become self learners, able to continue to develop their knowledge and skills throughout their professional careers.
 - E** To emphasize more on principles underlying medical science, fundamental practical skills and critical judgment based on evidence and experience than on the acquisition of defined compendium of current knowledge or comprehensive list of clinical skills.
 - F** To qualify graduates to share in solving community health problems through a high standard of dermatologic practice and research programs.

These discipline objectives were further detailed into scientific objectives related to knowledge, skills and attitudes for each dermatologic block of the program.

2.2.4. Introduction

In the traditional system, dermatology topics are taught in 5th year of undergraduate programs. Their teaching includes; clinical clerkship for 4 week and theory lectures (30 lectures) that are extended over 30 weeks of the whole academic year. In TUCOM, the dermatology course (program) is taught in the 5th year in 4 weeks periods. During the course time the students attach out-patient clinics and they give the theory of the topics during the 4 week period of the course. The appropriate models of implementation of the objectives include:

- Problem based learning

In this activity, a problem is presented at the beginning of the week (four problems presented for this discussion are,

Dermatitis, Papulosquamous diseases, Skin infection and Sexually Transmitted Diseases). The theoretical background of each topic is covered in a related week.

- Clinical teaching in outpatient Clinic
- Structural learning discussion (case presentation)
- Structural self-learning
- Structural Pathological Sessions

The multidisciplinary integration (Dermatology, Pharmacology, Anatomy, Physiology, Microbiology, Biochemistry, Histology, Community Medicine and Pathology) practice is an innovative learning environment.

2.2.5. Needs

In Iraqi Medical colleges there is separation in teaching of theory and clinical dermatology, i.e. the clinical attachment extends for 4 weeks, while the theory of dermatology is extended over 30 weeks of the academic year. Thus the 1st group performs the clinical examination at the end of the clinical attachment in taking only 4 theoretical lectures, while group 8 (the last group) attend the clinical examination, the theoretical lectures are completed. This will influence the performance of students' assessment as the last group gets a better opportunity than other groups. To overcome the problem, in TUCOM dermatology and other disciplines (Psychiatry, Orthopedic, Ophthalmology, ENT, Radiology, Rheumatology) are taught (Theory and Clinical) in a 4 week period.

2.2.6. Extended Effect

All the students are given the same opportunity to get knowledge, skills and attitude training. Accordingly their learning outcome measure is fair for all. The level of performance of competencies after completion of the program is closely related to the job description after graduation during the residency program. The program produces medical students education on a broad basis to enable them for further training, learning and practice in dermatology. In addition, students get knowledge that enables them to practice dermatology safely, exactly and effectively. Furthermore, students at the end of the program are trained as self-learners, able to continue to develop their knowledge and skills through their future professional careers.

2.2.7. Activities

Interactive lectures, PBL, Fixed Learning Modules, Seminars, Small Group divisions, Clinical Sessions (outpatient), Structural Self Learning, Structural Learning Division (case presentation), clinic-pathological meets.

2.2.8. Resources

Equipment, time, money, and information is available. In addition, there are good teaching packages of PPT, slide presentation as well as computer-aided teaching programs. Furthermore, pathological slides and laboratory investigations related to dermatological diseases are available. There are good trained staff who teach different sub-disciplines of dermatologic diseases such as dermatitis, Papulosquamous diseases, skin infection and STD.

2.2.9. Stage of Development

The program was implemented for 9 years and stopped, however, from the 2009/2010 academic year, it has been re-implemented.

2.2.10. Context:

There are external factors that may affect the program's success or outcomes such as Country Politics, College administration, National Medical Colleges Supervision Commissions, and Other Iraqi Medical Colleges.

2.2.11. Logic Model

The logic model of the evaluation process was developed and is presented in Figure 1 - next page.

III. Formulate the Basic Process

[Implementation] Evaluation Questions of the Selected Program

3.1. Introduction:

The evaluation must be focused to assess the issues of greatest concern to stakeholders while using time and resources as efficiently as possible [4-6]. Among the items to consider when focusing on evaluation are purpose, users, uses, questions, methods, and agreements. Questions establish boundaries for the evaluation by stating what aspects of the program will be addressed [4, 7-9]. Creating evaluation questions encourages stakeholders to reveal what they believe the evaluation should answer. Negotiating and prioritizing questions among stakeholders further refines a viable focus.

3.2. Process Evaluation Questions:

Evaluation questions 'defines the key issues to be explored by an evaluation' [3]. The process evaluation questions address program evaluation, particularly the who, what, when, and how many of program activities and program outputs [3].

3.3. Steps to develop Process Evaluation Questions:

The steps include: Gathering of stakeholders and review of supporting materials; Brainstorming; Sorting of evaluation questions; decisions on which evaluation questions to be answered; verifying the linkage; and determination of who, what, and how to collect the data [3].

3.4. Questions formulation:

Following a comprehensive review of evaluation models and examples, a mixed evaluation model was selected to meet institutional needs. The model included the logic model's program elements (input, activities, output and outcomes) and their causal relationships [10] and Kirkpatrick's first three evaluation levels [11-13]. Based on TUCON educational goals of objectives of Dermatology program; the following program evaluation questions were developed:

Q 1: Is the curriculum appropriate for the education of development of completed physicians.

Evaluation issue:-

Is there (appropriate) content in the curriculum for general profession education?

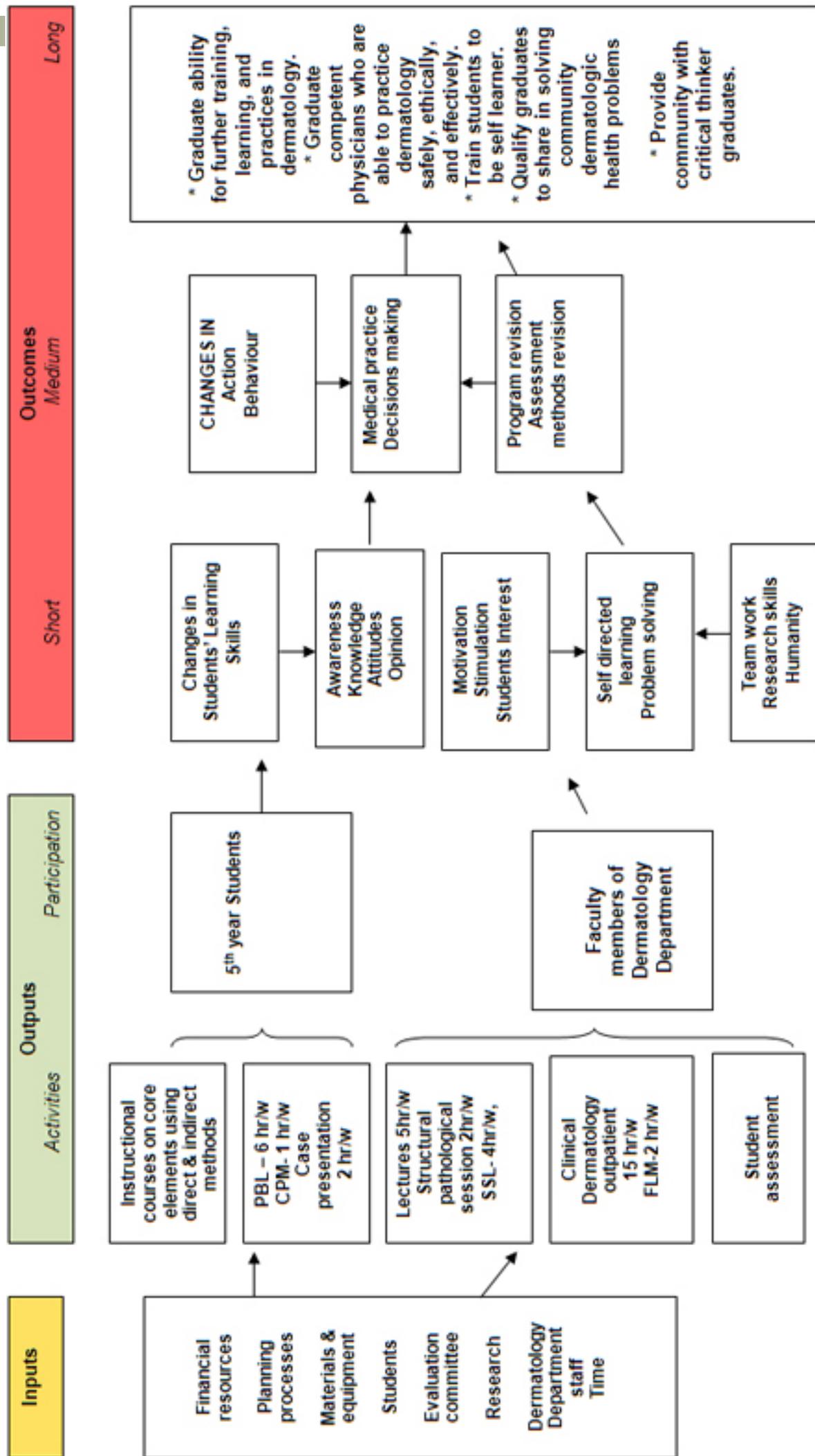


Figure 1: Logic model for evaluation of 5th year dermatology program

- . Determine whether the dermatology education program is having the desired impact on students.

Evaluation plan:

- . Solicit opinions of students as to how well the curriculum prepared them for the general practice of Medicine.
- . Annual survey of 5th year students' performance.
- . Review the students' performance in knowledge and skills at the end of the course and compare their results in knowledge and skills especially between the groups.

Q 2: Does the curriculum content and structure and the students' evaluation system adequately include the use of competencies?

Evaluation plan:-

- . Determine whether all competencies are addressed in the curriculum.
- . Review competency categories to determine where each objective fits into the curriculum.
- . Course and clerkship reports should be analyzed for the extent to which education and evaluation is competency based.
- . Review descriptors to be sure appropriate descriptors are being used for competencies.

Q 3: Was the clinical presentation model (as the primary mechanism for integrating basic and clinical science students) implemented as planned?

Evaluation plan:-

- . An annual narrative report should be provided by the evaluation subcommittee to describe progress in implementing the clinical presentation model.
- . Course of clerkship reports should be analyzed for the extent to which they use the clinical presentation model.

Q 4: Does the curriculum require students to learn independently (and if so specify where)?

Evaluation plan:-

- . Annually evaluate students' perception of their academic environment to promote independent learning.
- . Course and clerkship reports should include information about activities to promote independent learning.

Q 5: Is incorporation of the characteristics of outstanding physicians in the educational program essential for complete professional development of students?

Evaluation plan:-

- . Utilize student self and peer evaluation.

Q 6: Does effective healthcare delivery require the attention of the family and community context?

Evaluation plan:-

- . Assess how and where in the curriculum this topic is being formally addressed.

Q 7: Is there a balanced variety of clinical settings which are essential for students acquiring the mastery of competencies.

Evaluation plan:-

Decide upon and monitor the amount of time for out-patient in hospital versus PHC clinical training sites.

Q 8: Is informatics essential for effective acquisition and utilization of information by students?

Evaluation plan:-

- . Provide a narrative description of the progress made toward implementing the informatics plan adopted by the curriculum committee.
- . Evaluate students' use of informatics.
- . Determine what course and clerkship utilize formal informatics activities.

Q 9: Does the program improve students' knowledge and skills?

Evaluation plan:-

- . Determine whether new coming students change over time.
- . Evaluation of students' success (Group Comparison).
- . Evaluation of students' performance (Group Comparison).
- . Investigate students' opinions on the dermatology program.
- . Determination of training opinions on the dermatology educational program.

IV. Evaluation Design

A mixed research design is a general type of research that includes quantitative and qualitative research data, techniques and methods. All these paradigm characteristics are mixed in one case study. This method design involves research that uses mixed data (numbers and text) and additional means (statistics and text analysis). A mixed method uses both deductive and inductive scientific method, has multiple forms of data collecting and produces eclectic and pragmatic reports. [14] Two main types of a mixed method are: mixed method and mixed model research. A mixed research method is research in which you use quantitative data for one stage of research study and qualitative data for a second stage of research. A mixed model design is a research in which you use both quantitative and qualitative data in one or two stages of the research process. The mixing of quantitative and qualitative approaches happens in every stage of research [15]. In a research it is important to use a mixed research method for the conducting of detailed research. The advantages of mixed research are: [16, 17].

- 1) The strength of the research;
- 2) Use of multiple methods in a research helps to research a process or a problem from all sides;

3) Usage of different approaches helps to focus on a single process and confirms the data accuracy. A mixed research project complements a result from one type of research with another. This research does not miss any available data.

A quantitative component of mixed research assumes the usage of deductive scientific method while the qualitative component assumes inductive scientific method. Moreover, a quantitative approach collects quantitative data based on exact measurement applying structured as well as validated information collection, for instance, rating scales closed-ended items and responses. This approach produces statistical reports with correlations [18-20].

Proposed Design

A qualitative component uses qualitative information, for instance, interview, field notes, open-ended questions etc. This approach considers a researcher to be the major means of information collection. At the end of a research this approach supposes a narrative report with context description, with quotations taken from research material. [21] It is important to stress that there are many ways of performing research. Quantitative and qualitative methods have their advantages and disadvantages. However, you may summarize the advantages of both methods and have accurate information on implementation, findings and conclusions of your research project. Qualitative and quantitative research methods have different strengths, weaknesses and requirements that affect a researcher's project accuracy. The aim of a mixed method design is to summarize positive aspects of two approaches and produce highly accurate data. [22, 23]. When we use several methods in our research process, then we can use the strength of every type of information collection and minimize the weak points of both approaches. A mixed method approach of gathering and evaluation can increase the validity and accuracy of the information. The article briefly analyzes a mixed method research design including the major components: quantitative and qualitative approach for the design of research.

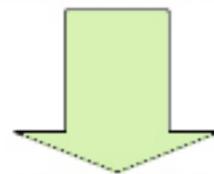
Sequential Exploratory Design

We select the sequential exploratory design to evaluate the program of teaching Dermatology for 5th year TUCOM students [Figure 2]. The sequential exploratory design has many features similar to the sequential explanatory design. It is conducted in two phases, with the priority generally given to the first phase, and it may or may not be implemented within a prescribed theoretical perspective [Figure 2]. In contrast to the sequential explanatory design, this design is characterized by an initial phase of qualitative data collection and analysis followed by a phase of quantitative data collection and analysis. Therefore, the priority is given to the qualitative aspect of the study [24, 25]. The findings of these two phases are then integrated during the interpretation phase [Figure 2].

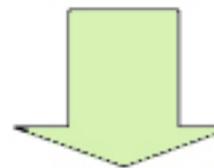
V. Data Collection

Depending on the nature of the information to be gathered, different instruments are used to conduct the assessment:

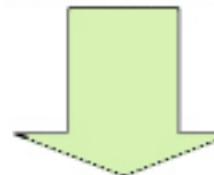
QUAL Data Collection



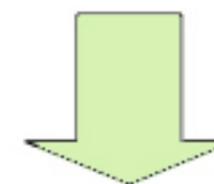
QUAL Data Analysis



quan Data Collection



quan Data Analysis



Interpretation of Entire Analysis

Figure 2: Visual Model of Sequential Exploratory Design

forms for gathering data from official sources such as police or school records; surveys/interviews to gather information from youth, community residents, and others; and focus groups to elicit free-flowing perspectives [26]. Self-administered surveys have special strengths and weaknesses. They are useful in describing the characteristics of a large population and make large samples feasible. In one sense, these surveys are flexible, making it possible to ask many questions on a given topic. This also provides flexibility in the analysis of the responses. On the other hand, standardized questionnaire items often represent the least common denominator in assessing people's attitudes, orientations, circumstances, and experiences. By designing questions that will be appropriate for all respondents, it is possible to miss what is most appropriate to many of the respondents. [27, 28]

Some advantages of the self-administered survey are:

- . **Low cost.** Extensive training is not required to administer the survey. Processing and analysis are usually simpler and cheaper than for other methods.
- . **Reduction in biasing error.** The questionnaire reduces the bias that might result from personal characteristics of interviewers and/or their interviewing skills.
- . **Greater anonymity.** Absence of an interviewer provides greater anonymity for the respondent. This is especially helpful when the survey deals with sensitive issues such as questions about involvement in a gang, because

Number	Variable	Mean \pm SD
1	Program implementation	3.43 \pm 1.08
2	Tutors / trainers	3.70 \pm 0.87
3	Assessment	3.96 \pm 0.76
4	Skills	3.76 \pm 0.74
5	Education resources	3.81 \pm 0.79
6	Attitudes	3.35 \pm 0.88
7	Knowledge	4.06 \pm 0.74
8	Needs [Expectation]	3.13 \pm 0.93
	Total	3.93 \pm 0.67

Table 1: Students' perception

Number	Variable	Percent		
		Agree & Strongly agree	Uncertain	Disagree & strongly disagree
1	Program implementation	49.3	38.4	12.3
2	Tutors / trainers	49.7	47.3	3
3	Assessment	70.9	28.1	1
4	Skills	58.1	41.9	
5	Education resources	12.9	54.8	32.3
6	Attitudes	32.3	59.1	8.6
7	Knowledge	75.8	24.2	
8	Needs [Expectation]	36	40	24
9	Total	48.1	41.7	10.2

Overall evaluation: 78.6%

Table 2: Frequency distribution of students' perception

respondents are more likely to respond to sensitive questions when they are not face to face with an interviewer.

Some of the disadvantages are:

- . **Requires simple questions.** The questions must be straightforward enough to be comprehended solely on the basis of printed instructions and definitions.
- . **No opportunity for probing.** The answers must be accepted as final. Researchers have no opportunity to clarify ambiguous answers.

The framework of the program evaluation was developed as described above. The 5th year students of TUCOM in the academic year 2009-2010 were included in the study. A questionnaire was distributed to the whole batch and the students were asked to complete it anonymously. The questionnaire consisted of 43 questions about students' perception on Program implementation, Tutors/Trainers, Assessment, Skills, Educational resources, Attitudes, and Needs. A five-point Likert scale was used with rating of each item with 1 minimum and 5 maximum. The questionnaire was developed in English and translated to Arabic, using expressions appropriate for our study group. The participants

reflected their perceptions of 43 questionnaire items which were not arranged in groups, but were distributed randomly. SPSS FOR Windows 2007 was used.

VI. Application

The results of all questions in each category surveyed were calculated in the form of the mean score and satisfaction percent. A mean score greater than 3 and satisfaction of more than 50% signifies a positive response. The scores reflecting students' perceptions of questionnaire statements ranged from 2.35 \pm 0.95 for the statement [The present teaching method focused on clinical training and neglected the theoretical teaching] to 4.61 \pm 0.49 to statement [implementation of 5th year dermatology program in one month is better than approach of giving theory on a 30 week period]. (P<0.0001).

The students' perception minimum mean of scores was 3.13 \pm 0.93 for needs and maximum mean was 4.06 \pm 0.74 for knowledge. However, the difference was statistically not significant (P=0.26). The overall mean of the scores reflecting students' perceptions was 3.93 \pm 0.67, which indicates students' satisfaction with both clinical and theoretical education [78.6%]. The frequency distribution of students'

satisfaction was more prominent in knowledge (75.8% agree and strongly agree) and lowest satisfaction was for availability of new educational resources (12.9% agree and strongly agree). In addition, the students' satisfaction was 70.9% for assessment, 58.1% for skills, 49.7% for tutors/trainers, 49.3% for program implementation, 36% for needs, and 32.3% for attitudes. [Table 2 - previous page]

About 63% of students were satisfied that program implementation in the present methods and strategies is fulfilling the learning objectives, with a score of 3.84. The course covers both theoretical and clinical teaching and there was no deficiency in teaching basic sciences (satisfaction: 84%). However, the time schedule for both clinical (Satisfaction: 58.1%, Score: 3.77) and theoretical (Satisfaction: 51.6%; Score: 3.48) teaching needs reform.

Tutors performance score given by students was 3.7, with about 50% of students agreeing or strongly agree with the tutor's performance. In addition, the students were more satisfied with teaching proper time management for clinical teaching (Satisfaction: 83.9%; Score: 4.06) as compared to theoretical teaching (Satisfaction: 70.9%; Score: 3.81). However, the students were not satisfied with the college administration providing of faculty training program (Satisfaction: 32.3%; Score: 3.35).

For assessment, students were satisfied with all items (question statement) with the exception of the validity of the present clinical examination (Satisfaction: 45.2%; Score: 3.61). The present teaching program of dermatology provides acquisition of skills by students in 58.1% and score of 3.77 and 58.1% (agree or strongly agree) of students were satisfied that they were able to provide healthcare accurately, effectively and ethically. However, only 16.1% of students agreed or strongly agreed that they were able to give their opinion without fear. College administration does not encourage students to announce their opinion in regards to educational programs, since only 35.5% of students agree or strongly agree that the college administration do that. The present study indicated that students agree or strongly agree to adding self-learning modules (45.2%; score 3.45), specifies study (Multidisciplinary) module (45.2%; Score: 3.35) and weekly discussion (41.9%, Score: 3.26) session on a specific topics.

VII. Comments

Here we report the design and results of the application of evaluation of the dermatology program in TUCOM. The results of this study suggested that all responding students [100%] had a positive perception about the course value as it is implemented in a 4 weeks period. The aim of this study was the evaluation of medical students' satisfaction with the clinical education and influence of organizational domain variables on this satisfaction. Clinical education is an important course in medical education and students spend more than half of their educational time both in PHCC, outpatients and inpatients settings. Those clinical experiences that satisfy medical students are consistent with literature in the health care professions [29, 30]. Trainees' satisfaction is an index for evaluating medical education, but there is little

research measuring this factor [31]. For this reason, the factors that influence satisfaction in medical students are not well understood. Duration of outpatient teaching did not have any significant association with students' satisfaction. It seems that students' participation and practice is more important than time of teaching, [32]. Course planning and curriculum structure had a significant association with students' satisfaction as this study indicated. Learning depends not only upon how teachers have planned their courses and subjects, but also upon how their students understand this planning [33]. Students' satisfaction has a role as an outcome of the educational process because students' satisfaction has been associated with later professional attitudes, career commitment and retention [30, 34, 35].

In the scale evaluating student perception of their tutor's performance, the overall scale was 3.7. However, this scale is considered as a positive response: it indicates that tutors' performance needs reform. TUCOM administration is not interested in Faculty development and students agreed or strongly agreed in 32.3% only. In addition, about 55% of students were not satisfied with teachers' standards of knowledge regarding learning resources, their ability to improve learning strategies and collaborate properly with their colleagues to implement the program. In the success of the educational programs, the importance of positive communication of tutors with students and positive learning environment are emphasized [36]. But the effective communication between clinical tutors and students is difficult to achieve since 55% of faculty member do not have good collaboration with their colleagues. It is thought that the absence of faculty development programs in TUCOM, which aim to improve educators' adaptation to the learning system, had a negative impact on clinical tutors' performance. [37].

The clinical tutor should establish a climate of openness that allows students to say what they believe or know, without fear of censorship or being put down. Learning can only occur when ideas can be freely expressed [36]. In the present study, only 16.1% of students agreed or strongly agreed to give their opinion regarding the learning program without fear. This finding indicated that college administration must encourage this activity. Students' feedback is an important component of program evaluation and has a positive impact on program reforms and improvement. It is emphasized that the role of students, the importance of student satisfaction, the fact that students are reliable and valid sources of information in the assessment of different parameters of the education process, and the feedback and proposals of students can be used in curriculum evaluation [38-41]. Thus TUCOM administration should develop a plan of action to encourage students to announce their opinion in regards to educational programs. Furthermore, this study indicated that only 12.9% of the study group was satisfied with the presence of new educational resources. This problem must be solved in faculty development and training programs should be started by the college administration.

Although the learning process in TUCOM is student-centered, 58.1% of the study sample perceived that the lecturer is the main source of knowledge, perhaps due

to the students' perceived lack of resources, difficulty in understanding the textbook because of language barrier, and the short time available for study. These factors could result in the belief that it is better to depend on what the lecturers provide. On the other hand students perceived a good attitude from the lecturers toward them, reflecting the awareness of the lecturers on the role of social support in motivating students and improving educational outcomes. It is expected that possession of personal computer, electronic learning resources availability and licensed software could influence the perception because they provide additional opportunity for learning outside of class time.

According to their learning outcome measure is fair for all. The level of performance of competencies after completion of the program is closely related to the job description after graduation during residency program. The program produces medical students' education on a board basis to enable them for further training, learning and practice in dermatology. In addition, students get knowledge that enables them to practice dermatology safely, exactly and effectively. Furthermore, students at the end of the program trained as self-learners, able to continue to develop their knowledge and skills through their future professional careers. Evaluation of the program indicated a students' positive opinion in regards to PBL and clinical training of 5th year in dermatology. Students' performance was good in clinical and communication skills.

The survey indicated that all students included in the study prefer the teaching of dermatology (theory and clinical) in the same 4 week period.

We recognize limitations of this study. First limitation was the major one was the lack of a control group. Secondly, there were no open comments requested. Thirdly, although efforts were made by the authors to explain the explorative nature of the study and that it bears no relation to the students' academic performance, there are still some concerns about the possible effect of student-lecturer relationships on reported students' perception. Such a bias would fall in the direction of overestimating positive perceptions.

The TUCOM method for data analyses used in this study was effective in summarizing data to identify the areas of weakness and strength. In this method we used two calculation tools, the Likert scale and the percentages of respondents who agree or disagree on ratings of each attribute (frequency value). One of the advantages of this method is that it does not violate statistical principles for manipulating non-parametric data. Data obtained from instruments that measure attitudes with 5-point Likert scale are non-parametric, however, the literature is replete with reports that have nonetheless ignored this rule [42-45]. Other workers [46-48] have avoided this mistake by reporting their findings as frequencies for each measured item. The TUCOM method avoids the flawed approach by using both statistical manipulation and frequency value for each item.

Conclusions and Recommendations

The fifth year dermatology teaching program was with positive outcomes as revealed by graduation of competent physicians in the field of dermatology. However, Dermatology clinical assessment methods need reform and should be a performance based assessment as the clinical examination performed on a single case. In stead there was a need to increase the number of cases used for clinical evaluation. All the students are given the same opportunity to get knowledge, skills and attitude training. The quality of teaching of the theoretical part of the program may be improved by interactive lecture. Availability of E learning resources is of vital importance. Furthermore, college administration must establish training programs for their faculty.

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Selective or Routine Episiotomy?

ABSTRACT

Objectives: To compare the outcome of selective versus routine use of episiotomy in Prince Rashid Bin Al Hassan Hospital, Jordan.

Materials and Method: This was a prospective observational study conducted for 916 singleton vaginal term deliveries. Patients were divided into two groups. The study group comprised 496 deliveries managed by selective episiotomy and the control group comprised 420 deliveries managed by routine episiotomy.

Results: The overall episiotomy rate in the control group was 68% (n = 284) and in the study group 24 % (n = 118). The selective use of episiotomy resulted in a significant reduction in the overall episiotomy rate ($P < 0.001$) in our hospital.

36 % of patients in the study group had had perineal laceration compared to 69% in the control group. There was 64 % reduction in perineal laceration in the study group compared to reduction in only 31 % in the control group. This means a great reduction of postpartum morbidity.

Only 2% of primipara in the 'Study Group' had severe third degree perineal tears.

Conclusion: Selective use of episiotomy will decrease the number of episiotomies and perineal lacerations which resulted in a considerable reduction in maternal morbidity due to perineal lacerations.

Key words: episiotomy, perineal lacerations, perineal tears, selective use, routine

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Introduction

Episiotomy has long been recommended to avoid perineal sequelae after delivery. Despite the absence of evidence of its efficacy, it is still very widely used. (1)

In fact episiotomy is one of the most commonly performed surgical procedures. In the United States it is perhaps the most commonly performed surgical procedure. (2)

Although the episiotomy rate for vaginal deliveries has decreased from 65% in 1979 to 39% in 1997, (1) this is still higher than the optimal rate of 30% or less suggested by systematic review. (3-5)

In spite of its high rate there is extensive disagreement about the necessity and benefits of this procedure.

The benefits of routine episiotomy were challenged, and the Cochrane systematic review concluded that a policy of restrictive, compared with routine, episiotomy involved significantly less trauma to the posterior perineum, fewer sutures, and fewer healing complications. (6)

We conducted this study to compare the outcome of selective versus routine use of episiotomy in our Hospital.

Materials and Methods

This prospective study was conducted at Prince Rashid Bin Al Hassan, Jordan, during the period between March 2010 to March 2011.

A total of 916 women were divided into a study group (496) where a selective policy of episiotomy was implemented and a control group of 420 women who had routine episiotomy performed. The control group consisted of 170 primipara and 250 multiparous women. The study group constituted of 186 primipara and 310 multiparous women.

Women were excluded from the study if there were :
instrumental deliveries, preterm deliveries, abnormal presentations, vaginal birth after caesarian (VBAC) and multiple gestations.

Correlations were recorded with specific attention given to the age of patient, parity, episiotomy, birth weight of the neonate and need for NICU admission.

A scoring system was devised to record the severity of perineal laceration. Intact perineum and first-degree perineal tears were given a score of 0. Episiotomy and second-degree perineal tears were given a score of 1, and third and fourth degree tears were given a score of 2.

In the selective episiotomy group (study group), for primigravidas as well as for multigravidas, episiotomy was given only when the second stage of labour was prolonged for more than 60 minutes, with an unyielding perineum, or if the birth attendant felt the need for an episiotomy to prevent more serious perineal tears. When indicated, only a mediolateral episiotomy was used.

Results

284 women had episiotomy in the control group compared to 118 in the study group, with an overall episiotomy rate of 68% Vs 68%, respectively. The selective use of episiotomy resulted in a significant reduction in the overall episiotomy rate ($P < 0.001$) in our hospital.

According to parity, in the control group 164 primiparas (96%) and 120 multiparas (48%) received an episiotomy. In the study group 74 primiparas (40%) and 44 multiparas (14%) were delivered with an episiotomy. (Table 1 - opposite page).

Among primiparas in the control group there were no tears recorded. In the study group 13% ($n = 12$) primiparas had second-degree tears and 2% ($n = 2$) had severe degree perineal tears. Among multiparas, in the control group 1.6% ($n = 2$) had second-degree tears, whereas, in the study group second-degree tears were noted in 10% ($n = 16$). There was no third or fourth degree tears noted in either group of multiparas in both groups (Table 1).

Comparing of episiotomy in control group and study group by birth weight of the neonate is given in Table 2 (opposite page). When the policy of routine use of episiotomy was implemented in the control group, episiotomy was given with equal frequency (range 57 - 74 %), irrespective of the birth weight of the neonate. In the study group when the neonate weighed less than 3.5 Kg, then the episiotomy rate was only 22%, whereas with neonates weighing more than 3.5 Kg the episiotomy rate was significantly higher 62% ($P < 0.001$).

There was no correlation of episiotomy or tears to maternal age in both the groups.

There was no difference in the neonatal outcome in the two groups. Among this study population there were 2 admissions to NICU for birth asphyxia, 1 each in the control and study groups. All these neonates had been delivered with the help of an episiotomy.

Discussion

Routine episiotomy use has historically been recommended to prevent severe perineal tears, prevent fetal injury (hypoxia and intracranial hemorrhage), reduce postpartum urinary and fecal incontinence, and provide better sexual function. (7)

Potential benefits of routine episiotomy to the fetus were thought to include a shortened second stage of labour resulting from more rapid vaginal delivery. (8)

The routine use of episiotomy has resulted in many researchers questioning the purpose of this procedure, as well as questioning the potential benefits attributed to episiotomy. Routine use of episiotomy has also resulted in overlooking the potential adverse consequences of episiotomy.

Maternal morbidity due to perineal trauma and episiotomy has been a subject of many studies.

J. Macarthur and colleagues tracked post-partum pain in 445 women who delivered babies vaginally at a hospital in Toronto, Canada.

Their study showed trauma to the perineum was more common among women who delivered their first child, those who had an episiotomy during vaginal delivery, and those who had an epidural for pain relief during the second stage of labor.

The researchers say that on the day of delivery, the women who reported trauma to the perineum were 30% more likely to report perineal pain compared with women without trauma. Also the percentage of women who reported perineal pain up to one week after childbirth varied among the women depending on the degree of perineal trauma. They found that 75% of women with an intact perineum reported pain one day after childbirth, and 38% a week later while 95% of women with 1st or 2nd degree tears in the perineum, involving skin and muscle of the vagina, reported pain one day after delivery, and 60% one week later. Also they indicated that 95% of women with 1st or 2nd degree tears in the perineum, involving skin and muscle of the vagina, reported pain one day after delivery, and 60% one week later. 97% of women who had an episiotomy reported perineal pain 1 day after childbirth, and 71% 7 days later. Moreover, 100% of women who had 3rd or 4th degree tears, an extension of the episiotomy to or through the rectum, reported pain 1 day following vaginal delivery, and 91% 7 days later. (9)

Vasanth Andrews et al indicated that five days after delivery, uncomplicated episiotomies resulted in more perineal pain than second degree tears. They concluded that spontaneous second degree tears cause less perineal pain than episiotomies. (10)

A. Williams et al studied the postpartum sexual functioning and its relationship to perineal trauma. They studied outcomes like sexual morbidity, dyspareunia, stress and urge urinary incontinence. In their study, women with perineal trauma reported significantly more morbidity (sexual morbidity,

	Control Group	Study Group
Primipara		
Normal Delivery	170	186
Episiotomy	96% (n=164)	40% (n=74)
Second-degree	1.6% (n=4)	10% (n = 32)
Third / Fourth degree	0	0
Multipara		
Normal Delivery	250	310
Episiotomy	48% (n=120)	14% (n=44)
Second-degree	1.6% (n=4)	10% (n = 32)
Third / Fourth degree	0	0
Total		
Vaginal Delivery	420	496
Episiotomy	68% (n=284)	24% (n=118)
Second-degree	0.6% (n=4)	11% (n=58)
Third / Fourth degree	0	0.8% (n=4)

Table 1 : Episiotomy and perineal tears according to parity

	Control Group		Study Group	
	<i>Episiotomy</i>	<i>perineal</i>	<i>Episiotomy</i>	<i>perineal</i>
< 2.50	67% (n=32)	0	22% (n=16)	16%(n=12)
2.50	74% (n=112)	1%(n=2)	21% (n=50)	9%(n=22)
3 – 3.5	66% (n=124)	1%(n=2)	22% (n=32)	17%(n=24)
> 3.50	57% (n= 16)	0	62% (n=20)	6%(n=2)

P value for episiotomy P < 0.001

Table 2 : Episiotomy and perineal tears according to birth weight

dyspareunia, stress and urge urinary incontinence. In their study, women with perineal trauma reported significantly more morbidity (sexual morbidity, dyspareunia, stress and urge urinary incontinence) than women with an intact perineum. Women with perineal trauma also resumed sexual intercourse later than women with an intact perineum. Women with a first- or second-degree tear reported significantly more perineal morbidity (stress incontinence, sexual morbidity) than women with an intact perineum, and resumed sexual intercourse later. (11)

In our hospital, the policy of selective use of episiotomy led to significant reduction in the incidence of perineal lacerations. Implementation of the policy of selective use of episiotomy led to 64% (n=159) women delivering with intact perineum, that is, without perineal trauma due to episiotomy or tear which means less postpartum perineal morbidity. In the control group, intact perineum was noted in only 31% (n=66). This translated into a statistically significant reduction in the number of perineal lacerations in primipara 41% (n=39), and in multipara 25% (n=54). Thus it would be fair to conclude that the policy of restricted use of episiotomy has a strong protective effect on the occurrence of perineal lacerations and it significantly contributed to lessen maternal morbidity. Perineal tears of severe degree were noted in 2%

(n=4) of primiparas in the 'Study Group', and none in the 'Control Group'. This number (n=4) was very small to make a statistical statement in our study, however, Anthony S et al reviewed more than 43,000 singleton vaginal deliveries and concluded that 84 episiotomies would have to be performed to prevent one severe-degree perineal laceration. In primiparas 48 episiotomies and in multiparous women 106 episiotomies would have to be performed to prevent one severe perineal tear. Results of our study also indicate that women, who deliver neonates weighing more than 3.5kg, were at an increased risk of receiving an episiotomy.

Conclusion

The policy of selective use of episiotomy resulted in considerable reduction in maternal morbidity due to perineal lacerations, without any increase in adverse neonatal or maternal outcome. It is advisable to be adopted instead of the routine episiotomy.

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