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Some microbiological and physiological aspects in patients with burn

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Abstract

A prospective study was undertaken to determine some aspects of microbiological and hematological studies occurring in general burn patients , the study included 40 individuals 30 patients and 10 control at the period from 15-1-2013 to 15-5-2013 in burn units of al-Hilla general teaching hospital the microbiologic results show (pseudomonas 46.6% ,Staphylococcus 23,3%,E coli 13.3% and klebsilla 16.6% in wound swap while the hematological results show increased in WBC count in patients compare with control and decreased in PCV compared with control

Introduction

Burns are one of the most common and devastating forms of trauma , they induce a state of immunosuppressant at predisposes burn victims to infection complication (church et al,2006) burn injury destroys the physical skin barrier that normal prevents the invasion of microorganisms colonization infection and clinical sepsis (vinderes and bjerkres ,1995)infection is a major complication of burn injury an is responsible for 50-60%of death , in burn patients (abston et al,2000)microbial colonization of the open wound primarily from an endogenous source begins with 24 hour and is usually established by the end of first week after burn injury (noronha and al meida ,2000)the organisims that predominant as contains agents of burn wound infection in any burn unit change overtime where GV+ organisms are initially prevalent and then gradually superseded by GV- opportunistic (pruilt and memauns,1992) p aruginosa is a non fermentation , aerobic Gv- rod at is prevalent in hospital environment and can cause severe neocolonial infection beside it ability to cause disease in particular susceptible individuals (passador et al ,1993) staphylococcus aureus is G v+spherical non motile bacterium usually arranged in group like irregular clusters (mims et al, 2000) Ecoli is a motile member of cuter bacterium it randy causes disease in healthy individuals (Al-hambera et al ,2004) .

Klebsilla is frequently usually caused human neocolonial infection and most of clinical isolate of klebsilla exhibit mucoid growth , large ,polysaccharide capsule and lack motility(clark et al,2003)

While in hematological changes the patients with major burn has suffered from the most severe forms of trauma , hematological changes produced in the circulatory system and respiratory system are complex and failure to under stand their progress and therapeutic managements can cause the patients further problems , it is well known that a severely patients presents the greatest dysregulation of homeostasis of any injury (muir ,1966) has shown that a general relation ship between the extent of burn and amount of red cell destruction .

(Baxter ,1979) observed a shorter life span of red blood cells all these changes have been attributed to the presence of some type of detrimental plasma factor because when the red cells injected in to normal person they survive a normal length of time also the serum of burn patients contain substances that inhibit the erythropoiesis that decrease in HB and PCV value in blood , significant leucocytosis was noticed in burn patients (Gruber and Farese 1989)

Reported peripheral leukocytosis in third degree burn ,injury leukocyte quantities were three to five times normal value .

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Materials and methods:

This study lasted from 15-1-2013 to 15-5-2013 in 40 individuals (30 patients and 10 normal) those patients were admitted to burn units at al-hilla general teaching hospital they were suffering from general degree burn injury the collection of blood was done in burn ward in al-hilla general teaching hospital 2 ml of blood are drawn for each hematological and microbiological studies , microhematocrite method was used to determine PCV, hepranized capillary tubes was done while in WBC count used chamber slide and turks solution to estimate the total WBC in one cupic millimeters of blood (brown,1976).

A single colony was taken from each primary position culture on blood agar and macconkey agar and it was identified depending on its morphological colony shape size, color, border, and teatun and then it was examined by the microscope after being stained with grams stain after staining the biochemical test were done on each isolate complete the final identification (macf Addin,200,forbes,et al,2007)

Statically analysis:

All values were expressed as mean and standard divasion the data were analyzed by using of computer SSPS program and taking $p<0.05$ as the lowest limit of significant , students t test was used to examine differences between group both t test and anova test were applied to determine the differences between group and another

Results

Isolation of bacteria Obtain results of biochemical test and microscopic examination of isolated bacteria confirmed that they are GV+ bacteria according to the morphological , microscopically, characteristic and biochemical test in table 1,2

test	E coli	P aeruginosa	Klebsiella
Grams stain	Gve-, short rode	Gve- rods	Gve-, short rode
capsule	-	+	+
Oxidase	-	+	-
Catalase	+	+	+
indole	+	-	-
Mr	+	-	-
Vp	-	-	+
Citrate	-	+	+
Urease	-	-	+
Tsi	Aia atigen	alkalic	Ala
H2s	-	-	-
Motility	+	+	-
hemolysis	-	Beta+	-_
Emb	Metallic sheen	pale	Centrally dark
Lactate fermentate	+	-	+

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Table 2
Morphological and biochemical feature for identification of gram positive isolate

Test	Staph aureus
Gram stain	Gv+cocci clusters
Capsule	-
Oxidase	-
Catalase	+
coagulyse	+
Hemolysis	hbeta
Esculin test	-
Urease	-
Growth on macconky	-
Manitol fermentation	+
Motility	-

Also table 3 showed the number and percentage of bacteria isolated

Bacteria	No.	Percentage%
pseudomonas	14	46.6%
Staph	7	23.3%
E coli	4	13.3%
klebsella	5	16.6%

Total number of patients=30 and control 10

Table 4

Bacteria	Pcv control	Pcv patients
pseudomonas	0.439± 0.0380	0.393+0.0426
Staph	0.439 ±0.0380	0.392+0.0416
E coli	0.439 ±0.0380	0.313+0.026
klebsiella	0.439 ±0.0380	0.343+0.0322

Values are mean ±sd $p<0.05$

Table 5

Bacteria	Wbc control	Wbc patients
pseudomonas	6.61±1.959	13.621±1.322
Staph	6.61±1.959	13.741±1.2005
E coli	6.61±1.959	11.975±1.353
klebsilla	6.61±1.959	15.02±2.1553

Values are mean ±sd $p<0.05$

Discussion

The result in table 1 ,2demonstrate general characters of Gv+ and Gv- bacteria that obtained from wound swabs positive culture regarding skin swabs were positive bacterial culture consisting of single and mixed bacterial growth , while no bacterial growth of skin swabs culture control these result agree with that obtained by(bagdonas 2004) who found that 86.5%of skin swabs were positive for bacterial growth also (Al –Akaylah 1999) reported that negative bacterial growth were found in

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approximately 8% of cultures of skin swabs the high percentage of positive bacterial culture of the skin swabs may be attributed to the fact that the burn wound has a higher incidence of interaction compared with other forms of trauma because of extensive skin barrier distribution as well as alteration of cellular and humeral immune response (sanyal et al ,1998).

He wound swabs sample showed positive cultures of them were of single growth , these findings reflect the higher percentage of bacterial contamination of the burn units which explain the higher percentage of positively of skin cultures found in this study (torregorossa et al 2000)observe that neocolonial infections are now clear in a phase of expansion as testified by statistical findings and particularly intensive care units including burn units as showed in which showed the frequency of bacteria skin swab it is clear from the total number of isolate that gram negative bacteria are more frequent than gram positive type this agrees with (kamel and Al- megeed 1997) who found all Gv-bacteria represented about 65% of micro organisms that cause burn wound infections and that this type of bacteria has assumed a primary lethal role among the cases of burn wound infection and septicemia the predominante of gram negative bacteria is clear from the high frequency of p aeroginosa in each source of the cultures this agrees with (maitra 2003) who state that offer burn injury the most common isolated micro organisms is the opportunistic type like p aeroginosa (mousa 1997) found that p aeroginosa is the most frequents bacteria in burn wound infections in swab culture other gram negative bacteria rather than last p aeroginosa are Ecoli and klebsilla in this study the 2 bacteria haves some frequency in burn unit (ravathi et al 1993);mansour and enayat 2004 about isolated each of klebsilla and Ecoli and other in burned patients in frequencies less than that of pseudomonas and staph au in this study the more frequent gram positive Bactria isolate from wound swab is staph aureus these result were approximately fitted with that of(sanyal et al 1998) who found that mithicilline resistant staph aureus comprised 92% of gram positive bacteria isolate were as (emmerson 1999)noted that staph aureus is still one of the most frequently encounter single bacteria species in hospital and continues top frequent case of burn wound sepsis ,

While in hematological changes the concentration of packed cell volume in burn patients are significant decrease in compression with control table 4 this study agrees with Esonbaty and Elotiefy who pointed out that PCV concentration show decrease in gradually bellow control level by day 4 post burn , the decreasing of PCV concentration are expected withadequate fluid resusciation but may also be a hallmark of cuult bleeding (stewart ;1998) (Delming et al., 2004) found hematosrite decreasing because of either plasma volume replacment in case of hemolysis from prolonged heat exposure or major loss of blood from non burn injury preexisting anemia or hypervolemia , significant leucocytosis was noticed in burn patients ,(D, Alesandro and Gruber 1990) noticed leukocytosis after 30% injury leukocyte quantities were 3 to 5 times normal value and that because increased consumption production by bone marrow

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