

Isolation and identification of gram negative bacteria from wound infection in general hospital at Diyala city

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Abstract

Fifty patients with post operative wound infections at a district general hospital in Baaquba were tested for bacterial growth. These patients were exposed to different operations such as (labroectomy,surgical ppendectomy, bullets accidents ,bombing accidents anddifferent surgical operations).All patients wounds were swabbed in period from May to August 2006and cultured , the isolated microorganisms were identified on the bases of their morphological ,cultural and biochemical characteristics.twenty six (52%) were positive for bacterial growth .Twenty (77%) yielded a pure culture and six(23%)of mixed culture isolate. These isolates,1(5%)were *Pseudomonas aeruginosa* ,4(20%) were *E. coli* , 3(15%)were *Klebsiella pneumoniae* and12(60%)were Gram positive.The incidence of bacterial growth was high among adult more than 15 years than children less than 13 years .Single and mixed culture were sixty six percent and sixty percent were in adults more than 15 years respectively whereas thirty four and forty percent of single and mixed culture were investigated in children less than 13 years respectively.The study also investigated the bacterial contamination in theater and coach of the same hospital, (1)were *Pseudomonas aeruginosa* , (3)were *E .coli*, (0) were *Klebsiella* and (7) were Gram positive for theater while(0) were *Pseudomonas aeruginosa* , (2) were *E. coli* , (1) were *Klebsiella* and (3) were Gram positive for coaches.

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المستخلص

تعد اخماج الجروح بعد العمليات الجراحية من المشاكل الرئيسية التي تواجه علاج المرضى الراقدين في المستشفيات بالإضافة إلى كونها احد الأسباب المهمة التي تؤدي إلى الوفاة.اجري هذا البحث في مستشفى بعقوبة العام في مدينة ديالى للفترة من أيار إلى آب 2006 وشملت (50) مريضاً كانوا قد خضعوا لعمليات جراحية مختلفة شملت (عمليات الزائدة الدودية ،حوادث الطلق الناري والانفجارات ،عمليات فتح البطن وعمليات الكسور) حيث تم جمع (50) عينة منهم وكانت نتيجة الزرع موجبة في (26) عينة اي بنسبة (52%) وان (24) عينة أعطت نتيجة سالبة اي بنسبة (48%) وكانت (20) عذلة منها تحمل الخمج المفرد أي بنسبة (77%) بينما (6) عذلة تحمل خمج مختلط أي بنسبة (24%) ،وقد تم إجراء تصنيف كيميحياتي لكافة العزلات السالبة والموجبة لصبغة كرام والمعزولة في هذا البحث باستعمال الطرائق التقليدية في التشخيص والمعتمدة في المختبرات الطبية أما الجراثيم التي كانت اكثر شيوعاً خلال هذه الدراسة فهي الجراثيم الموجبة لصبغة كرام *Escherichia coli* , *K.pneumoniae* Gram positive , *Pseudomonas aeruginosa* , بنسب (60%) و(15%) و(20%) و(5%) على التوالي. كذلك بينت نتائج البحث ان نسبة الخمج المفرد (66%) للفتنة العمرية الأكبر من 15 سنة ونسبة الخمج المختلط من الفتنة (60%) بينما نسبة الخمج المفرد كانت (34%) للفتنة العمرية الأقل من 13 سنة

Introduction

Although considerable progress has been made in understanding the cause and prevention of surgical site infections during the past 100 years, post operative wound infections (incisional and deep) remain a leading cause of nosocomial (hospital -acquired) infections, especially in developing countries(1). Characteristics of bacteria that are pathogens include transmissibility, adherence to host cells, invasion of host cells, tissues toxigenicity and ability to evade the hosts immune system. Many infections caused by bacteria that are commonly considered to be pathogens are in apparent or asymptomatic (2). Hospitalized patients and those with chronic diseases are at especially high risk of bacterial infection (3). The most widely used definition of surgical site infection (SSI) is probably superficial surgical site infection is defined as one that occurs within the skin or subcutaneous tissue of incision and at least one of the followings :

- 1-Purulent drainage from the superficial incision.
 - 2-Organisms isolated from an aseptically obtained culture of fluid or tissue.
 - 3-At least one of the following signs or symptoms of infection :pain or and superficial incision is deliberately opened by surgeon.
 - 4-Diagnosis of superficial incisional SSI by the surgeon or attending physician.
- Surgical site infections (SSI) have been estimated to occur in up to approximately 30% of patients whose surgical procedure was classed as SSI that are preventable is unknown (4) The pathogenesis of bacterial infection includes initiation of infectious process and the mechanisms that lead to the development of signs and symptoms of disease . The degree of post operative

wound infections varies from wound type to another ,from patient to patient from one operative method to another .However development of wound infection result in increasing the period of hospital residency and the cost of healing.(5). Since our hospitals now a days received a number of patients who exposed to bullets or bombings accidents so this study aim to know the type of gram negative bacterial species which cause this type of infection in order to control complications of this type of operations Baaquba General hospital of Diyala city.

Materials and methods

Sample collection: The swabs were taking from patients of both gender who suffer from post operative wound infections as diagnosed by a physicians and hospital residence that were exposed to different surgical operations . The swabs were taking before they were exposed to antibiotic treatment or after 3 days of their up taking of antibiotics doses .The information's for every patient were organized in a questionnaire ,which including (name, age, gender ,type of operation ,date of hospital iterance).The swabs then cultured during (10-15)min. on chocolate agar ,blood agar and MacConkey agar (they prepared and sterilized according to the company instructions) all cultured plates incubated aerobically at 37°C for 24hr.theater and coaches were swabbed also

Identification of the isolated microorganisms. Morphological characteristics:

- Direct smears were prepared and stained by Grams method for all collected specimens .
- Cultural characteristics: The different media which were previously inoculated

also their circulation may be impaired which also lengthens healing time(8 and 11).In addition to above reasons, generally elderly people more exposed to accidents (12).The study revealed the bacterial contamination of theater and coaches of Ba'aquba general hospital as demonstrated in table [5]G+v bacteria was highest rate among other bacterial isolates ,Klebsiella pneumoniae_ doesn't detected in theater swabs in contrast

detected in coach swabs ,however P. aeruginosa indicated in theater but at little rate whereas didn't indicated in coach swabs and this agree with (Aniassie) that P.aeruginosa is widely distributed in nature and is commonly in moist environments in hospitals ,it can colonize the normal humans in whom it is saprophyte. it causes disease in humans with abnormal host defenses(13).

Table (1): Differentiation of Enterobacteriaceae of biochemical tests.

Bacterial species	Urease	Cit	VP	MR	I
<i>Pseudomonas aeruginosa</i>	-	+	-	+	
<i>E. coli</i>	-	-	-	+	+
<i>Klebsiella pneumonia</i>	+	+	+	-	-

(-)Negative (+) positive I=Indol VP=Voges-proskauer
MR=Methyl red Cit=citrate utilization

Table (2): Number and percentage of pure culture isolates

Bacterial isolate	No. of isolate	(%) of isolate
<i>Pseudomonas aeruginosa</i>	1	5
<i>E. coli</i>	4	20
<i>Klebsiella pneumoniae</i>	3	15
Gram positive	12	60
Sum.	20	100

Table (3): Number and percentage of mixed culture isolates

Bacterial isolate	No. of isolate	(%) of isolate
K. + <i>E. coli</i>	5	83
<i>P. aeruginosa</i> + <i>E. coli</i>	1	17
Total.	6	100

Table (4): Percentage of single and mixed culture according to age group

Age	% of single culture isolate	% of mixed culture isolate
Children <13 years	34	40
Adult >15 Years	66	60
Total.	100	100

Table (5): Percentage of pure culture in theater and coaches.

Swab Type /%	Pseudomonas aeruginosa	E.coli	Klebsiella	Gram positive
Theater	1	3	—	7
Coach	—	2	1	3
Total.	1	5	1	10

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