Microbiological Survey Of Orthopedic Theatre In Nassyriha

Dr - Kareem Al Zirkani; M.B.Ch.B, F.I.C.M.S.
Thi-Qar health office

الخلاصة

تمهيد :-

ان واحدا من اهم المبادىء الاساسية في عملية تقديم العناية والخدمات الطبية في المستشفيات ان لا تكون باي شكل من الاشكال سببا في ايذاء المريض ' فبالرغم من قصر المدة التي يقضيها المريض في صالة العمليات مقارنة مع تلك التي يقضيها في ردهات المستشفى الا ان بيئة هذه الصالات قد تلعب دورا كبيرا في تفشي وانتقال التلوث الجرثومي وهكذا يعد تلوث غرف العمليات سببا هاما في حدوث عدوى المستشفيات ، ويمكن لنا ادراك حجم هذه المسالة اذا ما تصورنا النتائج المترتبة على حدوث التلوث الجرثومي في عمليات المفاصل والكسور وتاثيره على الفرد والمجتمع .

الاهداف

تهدف هذه الدراسة الى تقييم وقوع التلوث الجرثومي في غرف العمليات والتعرف على مصادر هذا التلوث

الطرق

بين اشهر اب ٢٠٠٨ واب ٢٠٠٩ تم اخذ ٧٦٨ مسحة من مواقع مختلفة في صالة العمليات مثل (سرير المريض ، ارضية الصالة ، جدران الصالة ، اجهزة سحب السوائل ، سوائل التعقيم ،اجهزة التخدير ،الشاش الطبي والاجهزه الجراحية) بواقع مسحة واحدة من كل موقع اسبوعيا وعلى مدار السنة ومن غرفتي العمليات (١,٢) في صالة الكسور في مستشفى الامام الحسين في مدينة الناصرية .

تم زرع هذه المسحات طبقا للطرق المتبعة في الزرع الجرثومي وبعد ذلك تم قرائتها وتشخيصها لمعرفة المزارع الجرثومية الايجابية ومن ثم معرفة اكثر الجراثيم المستفردة .

النتائج

اظهرت النتائج ان نسبة المزارع الجرثومية الايجابيه هي (٢.٧٣ %) وكانت العنقودية البشروية هي اكثر الجراثيم المستفردة في المسحات الماخوذه من سرير صالة العمليات بينما كانت القولونيات هي الاكثر في مسحات ارضية وجدران الصالة .

الاستنتاجات

ان النسبة العالية من المزارع الجرثومية الايجابية سجلت في المسحات الماخوذه من سرير صالة العمليات وارضية وجدران الصالة وكانت العنقودية البشروية هي الاكثر في مسحات السرير بينما كانت القولونيات هي الاكثر في مسحات ارضية وجدران الصالة.

Abstract

Background: One of the cardinal principles of the hospital care is that it should cause no harm to the patients. Inspite of brief stay of the patients in the theatre, the environment of operating theatre plays a great role in the onset and spread of infection, so contamination of the operating theatre is a major cause of nosocomial infection.
Bone and joint infection are considered as a major cause of morbidity, emotional stress, and enhanced mortality in addition to significant economic loss and so one could imagine the magnitude of this problem.

Objective: To evaluate the incidence of bacterial contamination of the operating rooms of the orthopedic theatre, in Al Imam Hussein hospital in Nassyriha and to identify the contaminating agents and their distribution within different sites of the operating room.

Methods: Between August 2008 and August 2009, 768 swabs collected from couch, floor, wall of operating room , suction apparatus, antiseptic solution ,anesthetic trolleys, gauze and surgical instruments of two operating rooms of orthopedic theatre.
The swabs were cultured directly and standard methods of identification were used .The identification were confirmed by biochemical tests.

Results: The incidence of positive cultures as a total was 21/ 768(2.73%) with high incidence were detected in those swabs obtained from couch 6/96 (6.25%) , the floor 5/96 (5.20%) and wall of operating rooms 5/96 (5.20%). Lower incidence were recorded from suction apparatus 2/96 (2.08%), antiseptic solution 2/96 (2.08%) and anesthetic trolleys 1/96 (1.04%).
Staphylococci were the most common isolate from couch 4/6 (66.66%), while E coli from the floor 4/5 (80%) and the wall of the operating room 3/5 (60%).

Conclusion: High incidence of positive cultures was detected from the couch, the floor, and the wall .The most common contaminant bacteria were Staphylococci and E coli.
Key wards: Al Nassyriha , Orthopedic theatre, Infection.

Introduction

Before the mid-19 th century, surgical patients commonly developed post-operative" irritative fever" followed by purulent drainage from their incision, overwhelming sepsis, and death.
After Josef Lister introduced the principles of antisepsis, at the late 1860s, Listers work radically changed surgery from an activity associated with infection and death to a discipline that could eliminate suffering and prolong life.(1)
The theatre environment consists of many components; operating theatre facilities, air quantity, water supply ,handling of medical waste and laundry in addition to the staff of theatre ,all these may influence and facilitate the occurrence and spread of infection. (2,3)
Quantitatively, it has been shown that if a surgical site is contaminated with $>10^5$ microorganisms per gram of tissue, the risk of surgical site infection is markedly increased (4).However, the dose of microorganisms to produce infection may be much lower when foreign material is present(5,6)
Surgical site infections are the third most frequently reported nosocomial infection, accounting for 14% to 16% of all nosocomial infection among hospitalized patients(7)

Methods

Between August 2008 and August 2009, 768 swabs were taken from two operating rooms of orthopedic theatre in Al Imam Hussein hospital in Nassyriha .Samples were collected weekly with cotton-tipped swabs from couch, floor, wall of the room , suction apparatus, antiseptic solution, anesthetic trolleys, gauze and surgical instruments. The operating room ventilation was excluded in this study.
The collection was done by a medical care employee belonging to the general medical laboratory of Thi-Qar health office.
The swabs obtained were cultured directly in prepared MacConky and blood agar media by streaking method, and standard methods of identification were used according to Holt et al .(8,9)
The cultured plates were incubated aerobically over night at 37 ̊C for 24 hours, and then culture characteristics were examined including colony morphology, characteristic appearances such as haemolysis, pigmentation, lactose – fermentation, swarming phenomena.

The identification were confirmed by biochemical tests, including the coagulase test, oxidase test, catalase test methyl red test, indole test and citrate utilization.
The viruses were excluded from this study because of the difficulty of isolation and unavailability of tissue culture in our laboratory.

Results

The incidence of positive cultures as a total was 21/ 768 (2.73 %) with high incidence were detected in those swabs obtained from the couch of operating room 6/96 (6.25 %), the floor 5/96 (5.20 %) and the wall 5/96 (5.20%). Table (1), diagram (1)
Lower incidence of positive cultures were recorded in those swabs taken from the suction apparatus 2/96 (2.08%), antiseptic solution 2/96 (2.08%) and anesthetic trolleys 1/96 (1.04 %).
The swabs from gauze and surgical instruments showed no growth of bacteria. Table (2), diagram (2)

Table 1
The incidence of Positive Cultures as a total

Results of swabs	No.	%
Positive cultures	21	2.73%
Negative cultures	747	97.26%
Total	768	99.99%

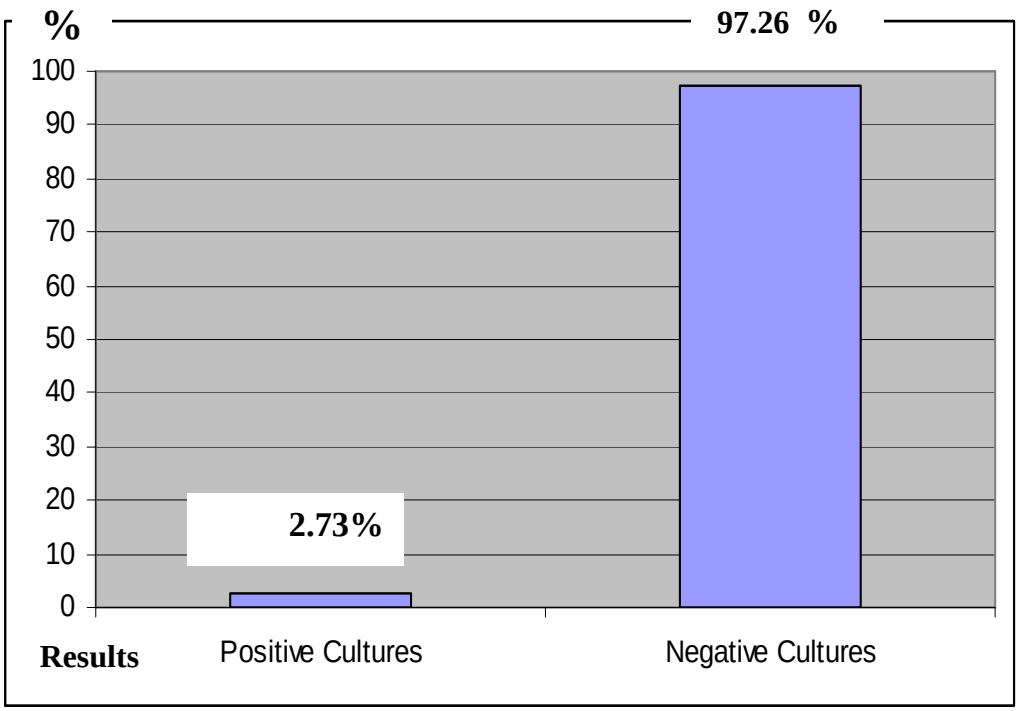


Diagram (1)

Table 2: The Number and percentage of positive cultures at different sites

Sites of swabs	No.	%
couch	6\96	6.25%
Floor	5\96	5.20%
Wall	5\96	5.20%
Suction Apparatus	2\96	2.08%
Antiseptic solution	2\96	2.08%
Anesthetic Trolleys	1\96	1.04%
Gauze	0\96	-
surgical instruments	0\96	-

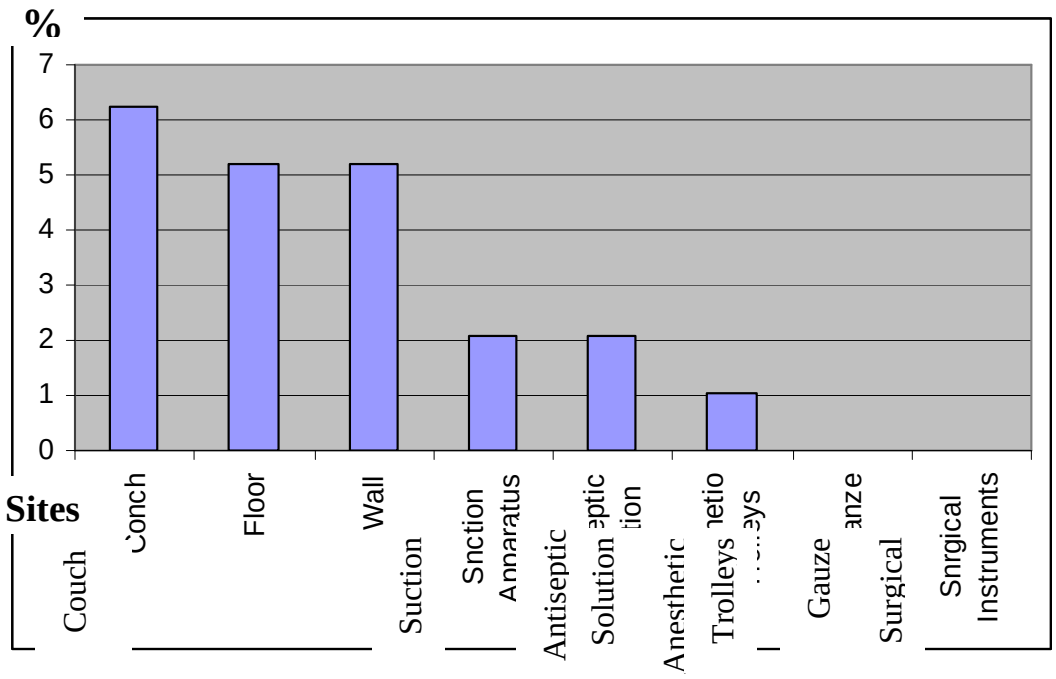
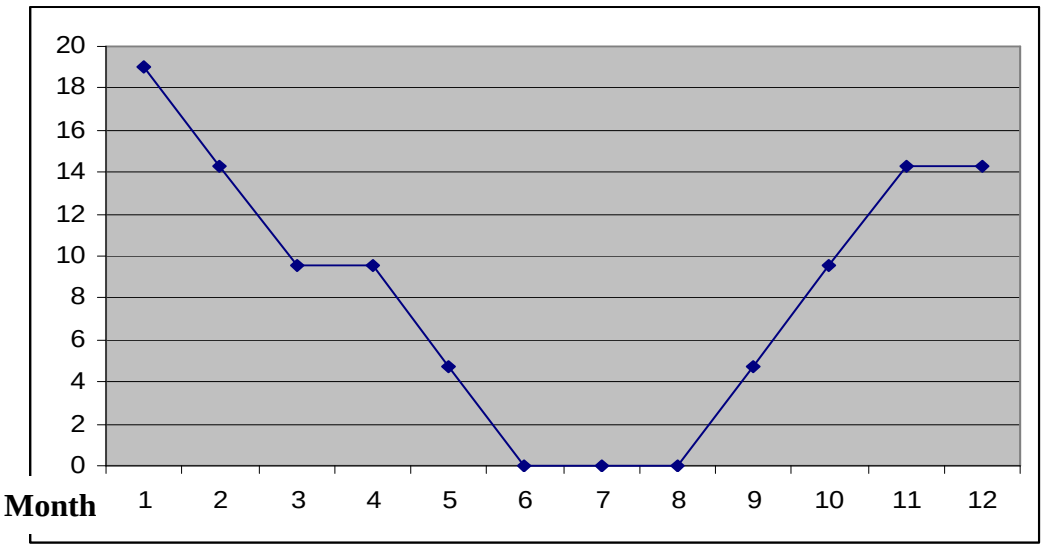


Diagram (2)

The time distribution of positive cultures showed no clear pattern in different months, but in general there was a decrease in the summer months. Diagram (3)

Diagram (3)

The incidence of positive cultures (total number) per month



Identification of bacterial isolates revealed that Staphylococci was the most common isolate of the couch 4/6 (66.66 %) ,while E.coli was the most common isolate of the floor 4/5 (80 %) and wall of the room 3/5 (60 %) .
Proteus and Klebsiella were isolated from the two positive cultures of the antiseptic solution. Staphylococci isolated from suction apparatus and anesthetic trolleys .Table(3).

Table 3
The number and percentage of the most common isolated bacteria

site & swabs	NO.	%
couch	Staphylococci 4/6	66.66%
Floor	E.coli 4/5	80%
Wall	E.coli 3/5	60%
Suction apparatus	proteus 1/2 klebsiella1/2	50% 50%
Antiseptic solution	staphylococci 2/2	100%
Anesthetic trolleys	staphylococci I/I	100%

Discussion

The higher incidence of positive cultures was recorded in those swabs obtained from the couch, floor and wall of the operating room which reflect lack or insufficiency of advances in infection control practices which includes; improved operating room ventilation, sterilization methods, barriers, surgical technique and availability of antimicrobial prophylaxis.

The highest number of contaminant bacteria of the couch was Staphylococci.The sources of this pathogen is either endogenous flora of the patient's skin[10] or exogenous source from surgical personnel (surgical team). [11,12]

The E.coli was the dominant bacteria of the floor and wall of the operating room in which the food and water supply were the main sources of contamination.

Our results revealed some factors to be considered. One of these factors; the patient should be well prepared for operation including patient cloth, hair at the site of operation ,use of antiseptic and disinfection, use of antibiotic prophylaxis and bowel preparation.

The second factor; some bacteria,e.g.,Staphylococci, E.coli have a greater propensity to cause contamination, especially in operating theatre, so extensive infection control practices are necessary to prevent these pathogens.

The third one; the environment of the theatre is important, especially to avoid air borne transmission of bacteria and transmission to the water supply and food,

so theatre discipline and surgical expertise are essential components in the fight against sepsis.[3]

In comparison with other series ,the incidence of positive cultures was 23/622 (3.7%) in 2001 and 24/594 (4.0 %) in 2002 in S .Ensayef.et al study .The incidence in our study was 21/ 768 (2.73 %) . The difference may be attributed the fact that our study was done in one theatre only (orthopedic theatre) rather than other factors [13]

Conclusion

1-The high incidence of positive cultures was detected in the couch, floor and wall of the operating room.

2-The most common contaminant bacteria were Staphylococci and E. coli.

3-Regarding the seasonal factor there was no clear pattern in the incidence in different months, but in general there was a decrease in the summer season.

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