

## الآية

بسم الله الرحمن الرحيم

قال تعالى:

وَلَوْلَا فَضْلُ اللَّهِ عَلَيْكَ وَرَحْمَتُهُ لَهَمَّتْ طَائِفَةٌ مِنْهُمْ أَنْ يُضِلُّوكَ وَمَا  
يُضِلُّونَ إِلَّا أَنْفُسَهُمْ ۗ وَمَا يَضُرُّونَكَ مِنْ شَيْءٍ ۗ وَأَنْزَلَ اللَّهُ  
عَلَيْكَ الْكِتَابَ وَالْحِكْمَةَ وَعَلَّمَكَ مَا لَمْ تَكُن تَعْلَمُ ۗ وَكَانَ فَضْلُ  
اللَّهِ عَلَيْكَ عَظِيمًا

صدق الله العظيم

سورة النساء

الآية 113

## *DeDication*

**I dedicate this work to my family and many friends..**

**A special feeling of gratitude to my loving parents, father**

**Ahmed Mohammed Nasr and lovely mother Mona Nasr Ali**

**whose words of encouragement and push for tenacity ring in my ears..**

**Without their love and support this project would not have been made possible.**

**To my sweet sisters..**

**To my only brother...**

**To my friends who helped me..**

**To all of them I dedicate my work.....**

## **Aknowledgements**

First of all,thanks of Allah for his gifts which never ends and for facilitate everthing in my life.Thanks to Sudan university of Science and Technology (SUST) College of Medical Laboratory Science.

I whould like to thanks all teaching staff in this college and special thanks to my supervisor Dr.YousifFadl-Allah for his advises and helping to make this project successful,also thanks to U.Yassin for his helping.

Thanks are extended to the technician in the laboratory of microbiology in Sudan university of Science and Technology .

Thanks to everyone help me in researching on different fields concering this project,my friends nashwa and hajer.

**Thanks to all**

## Abstract

This study aims at isolation and identification of bacteria contaminating operating theaters in Khartoum Teaching Hospital (gynecological and pediatric surgery).

Fifty swabs samples were obtained from different sites in operating theater.(bed,trolleis,floor,air,operating lamps).

The isolation was done by using MacConkey's and blood agar,and streaking technique was employed for the isolation and purification of the colonies.

The identification was done by using Gram's stain and biochemical tests.The study reveals that 44% of operating theaters were contaminated with bacteria.

The isolates were *Pseudomonas aeruginosa* was the most common isolate (63.6%), followed by *Micrococci.spp* (22.7%),*Bacillus . spp*(9.2%), and *Staphylococcus. aureus*(4.5%)

## ملخص الاطروحة

تهدف هذه الدراسة إلى عزل والتعرف على البكتيريا الملوثة لغرف العمليات في مستشفى الخرطوم التعليمي (جراحة أمراض النساء و جراحة الأطفال).  
وتم الحصول على خمسين عينة مسحة من مواقع مختلفة في غرفة العمليات (السرير، وعربات صغيرة ، الارض، والهواء، ومصابيح التشغيل).  
و تم العزل باستخدام الماكونكي اجار وأجار الدم، وتقنية التخطيط لعزل وتنقية المستعمرات.  
و تم التعرف باستخدام الاختبارات البيوكيميائية وصبغة غرام. وتكشف الدراسة أن 44% من غرف العمليات كانت ملوثة جرثوميا.  
كانت النتائج ان الزائفة الزنجارية المعزولة الأكثر شيوعا (63.6%)، تليها المايكرو كوكاي (22.7%)، الباسلاس (9.2%)، والمكورات العنقودية الذهبية (4.5%).

## Contents

Title	Page NO
الاية	I
Dedication	II
Acknowledgements	III
Abstract	IV
ملخص الاطروحة	V
Contents	VI
List of tables	VIII

### Chapter one

1.1. Introduction	1
1.2 Objective	3
1.3. Literature review	4
1.3.1 Definition of Nosocomial Infection	4
1.3.2 Bacteria	4
1.3.3 Reservoirs and transmission	5
1.3.4. Factors influencing the development of nosocomial infections	6
1.3.4.1 The microbial agent	7
1.3.4.2 Patient susceptibility	7
1.3.4.3 Environmental factors	8
1.3.4.4 Bacterial resistance	8
1.3.5. Surgical wound infections (surgical site Infections)	9
1.3.6. Sources of contamination	10
1.3.6.1 Airborne contamination	10
1.3.6.2 Surface contamination	11
1.3.7 Prevention and control of infection in Operation Theatre	12
1.3.7.1 Ventilation	12
1.3.7.2 Environmental surfaces	13
1.3.7.3 Disinfection of patient equipment	14

1.3.7.4 Conventional sterilization of surgical instruments	15
1.3.7.5 Flash sterilization of surgical instruments	17
1.3.7.6 Antimicrobial prophylaxis	17

## Chapter Two

2.1 Type of study	19
2.2 Studyarea	19
2.3 Sample size	19
2.4 Materials	19
2.4.1 Media	19
2.4.2 Glass wears	20
2.4.3 Others	20
2.5 Collection of samples	20
2.6 Isolation	20
2.7 Identification	20
2.7.1 Gram's stain	20
2.7.2 Biochemical tests	21
2.7.2.1 Kligler's Iron Agar (KIA)	21
2.7.2.2 Indol test	21
2.7.2.3 Citrate test	21
2.7.2.4 Urease test	21
2.7.2.5 Oxidase test	22
2.7.2.6 Catalase test	22
2.7.2.7 Deoxyribonuclease (DNase)test.	22
2.7.2.8 Mannitol salt agar (MSA)	22
2.7.2.9 susceptibility testing	23

### Chapter Three

Results	24
Chapter Four	
Discussion	37
Chapter Five	
5.1 Conclusion	30
5.2 Recommendations	30
References	
References	32
Appendices	
Appendices	35

### List of Tables

Table 3.1	Bacteria morphology and Gram staining	24
Table 3.2	Biochemical characteristic of isolated gram positive bacteria	24
Table 3.3	Biochemical characteristic of isolated gram negative bacilli	25
Table 3.4	Number and percentage of bacterial species isolated from operating theaters	25
Table 3.5	percentage of bacterial contamination on screened objects in operating theaters	25
Table 3.6	percentage of contamination rate in each operating theaters	25
Table 3.7	Antimicrobial susceptibility pattern of <i>p.aeruginosa</i>	26
Table 3.8	percentage of sensitivity and resistant to each antibiotics	26