

Sudan University of Science & Technology (SUST)
College of Graduate Studies

**Bacterial Urinary Tract Infections
in Diabetic Patients**

**إصابات المسالك البولية الجرثومية لمرضى
السكري**

**A dissertation submitted for partial fulfillment of the requirements for
M.Sc. degree in Medical Laboratory Sciences (Medical Microbiology)**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى

وَقُلْ رَبِّ زِدْنِي عِلْمًا

صدق الله العظيم

سورة طه الآية 114

I wish I can break from my ribs
to make a pen,

To cut from my skin to make a
paper

To take from my blood to make
an ink..

To write these words and
dedicate it to:

My father and mother

My brothers and sisters

My teachers special Dr.
Abdelbagi ELnagi Mohammed

My colleague and friends

Any person who supported me
till I reach this stage

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ABSTRACT

The main objective of this study was to isolate the possible bacterial pathogens from the urinary tract of diabetic and non-diabetic patients (as control). A total of hundred specimens (n=100) were collected from Jabir Abuliz Specialized Center for diabetic patients, Khartoum North Teaching Hospital and Police Hospital. Samples were collected from both males and females at different ages and then cultured and incubated at 37°C for overnight. Isolated bacteria were identified by Gram stain and biochemical tests. The most common isolated bacteria among the diabetic Patients were *Escherichia coli* (16%), followed by *Klebsiella pneumoniae* (10%), *Staphylococcus aureus* (8%) *Pseudomonas aeruginosa* (6%), *Staphylococcus saprophyticus* (4%), *Proteus mirabilis* (2%) and *Enterococcus faecalis* (2%),

E. coli were the most prevalent bacteria (42%) isolated among non-diabetic patients, followed by *S. aureus* (12%), *K. pneumoniae* (8%), *P. aeruginosa* (6%) and *P. mirabilis* (4%). The study showed that among diabetic patients, infections of females were fairly high (70.8%) compared to male patients (29.1%). However, prevalence of infection was significantly higher ($P < 0.05$) among non- diabetic females (75%) than diabetic females. Most isolated Gram – negative bacteria were sensitive to trimethoprim, ciprofloxacin, nitrofurantoin, nalidixic acid, ceftazidime and ampicillin except *P. aeruginosa*, *P. mirabilis*, which were resistant to ampicillin among diabetic patients. Furthermore, the most isolated Gram –positive bacteria were sensitive to gentamicin, vancomycin and penicillin except *S. saprophyticus* and *E. faecalis* among diabetic patients and *S. aureus* among non-diabetic patients.

الخلاصة

أجريت هذه الدراسة لعزل العوامل الممرضة الجرثومية المحتملة من اخماج المسالك البولية للمصابين بالسكري مقارنة بغير المصابين به. وتهدف الدراسة أيضاً لحساب نسب هذه العوامل الممرضة وعمل اختبارات الحساسية للمضادات الحيوية لجميع أنواع البكتريا المعزولة.

أخذت عينات البول من مستشفى جابر أبو العز التخصصي لمرضى السكري ومستشفى بحري التعليمي ومستشفى الشرطة. جميع العينات تم عزلها وحفظت في درجة حرارة 37 درجة مئوية لمدة 24 ساعة. وتم التعرف على البكتريا المعزولة بواسطة الأصباغ والاختبارات الكيموحيوية.

توصلت الدراسة إلى أن أكثر أنواع البكتريا إنتشاراً بين إصابات الجهاز البولي لمرضى السكري هي الإشريشيا القولونية بنسبة 16% تليها الكلبسلة الرئوية بنسبة 10% والعنقودية الذهبية بنسبة 8% والزائفة الزنجارية بنسبة 6% والعنقودية المترمة بنسبة 4% والمتقلبة الرائحة بنسبة 2% والمكورات العنقودية السبحية بنسبة 2%. وأكثر أنواع البكتريا إنتشاراً بين إصابات الجهاز البولي لغير المصابين بالسكري كانت أيضاً الإشريشيا القولونية بنسبة 42% تليها العنقودية الذهبية بنسبة 12%، ثم الكلبسلة الرئوية بنسبة 8%، والزائفة الزنجارية بنسبة 6%، والمتقلبة الرائحة بنسبة 4%.

وجدت الدراسة أيضاً أن معدل الإصابة في العينات المأخوذة من إناث مرضى السكري أقل بكثير من الإناث الغير مصابين بمرض السكري. أثبتت الدراسة من خلال إجراء تفاعلات الحساسية للبكتريا المعزولة ضد المضادات الحيوية أنه لا توجد فروق كبيرة بين مرضى السكري والغير مصابين بالسكري في استجابة جميع أنواع البكتريا المعزولة منهم لأنواع المضادات الحيوية التي استعملت في هذه الدراسة وهي الامبسلين، السبروفلووكساسين، كوتراميكسازول، ناليدكسيك اسد، سفتازيديم، تراميثوبريم والاميكاسين ما عدا الكلبسلة الرئوية، الزائفة الزنجارية والمتقلبة الرائحة، حيث أظهرت مقاومتهم للامبسلين. أما بالنسبة للفانكوميسين والجنتاميسين والبنسلين فقد أظهرت أغلب البكتريا المعزولة حساسيتهم ما عدا العنقودية المترمة لعينات مرضى السكري والعنقودية الذهبية لعينات غير مرضى السكري لمضاد البنسلين.

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