REVIEW IN PREVALENCE AND CHACTERIZATION OF EXTENDED SPECTRUM BETA LACTAMASES PRODUCING *PSEUDOMONAS AEROGINOSA* IN NIGER

PRESENTED

BY

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DECEMBER – 25 – 26 - 2024

Presentation Outline

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Introduction

- *Pseudomonas aeuroginosa* is one of the most frequent opportunistic pathogens causing a range of infections and are resistant to beta-lactamases cause the emergence and spread of extended spectrum beta-lactamases (ESBL) producing *P. aeuroginosa* and are two of the major problems currently threatening global public health.
- However, there are many reported cases of (ESBL) producing *P. aeuroginosa* in Nigeria. Yet, there are area and places in Nigeria where cases of ESBL are under-reported
- . This review aimed to assess prevalence and characterization of ESBL producing *P. aeuroginosa* in Nigeria. Yet, there are area and places in Nigeria where cases of ESBL are under-reported. This review aimed to assess prevalence and characterization of ESBL producing *P. aeuroginosa* in Nigeria.
- Extensive literature was carried out through an electronic database search encompassed African Journals Online, Google Scholar, PubMed, Medline, Web of Science, and Scopus were searched to retrieved relevant academic journals.

Introduction cont'd…

- During the research a total of one hundred and fifty (150) publication were revived from previous researches articles published between 2012 and 2024 and were used for this review.
- The titles and abstracts of retrieved articles were reviewed of which fifteen (15) articles were selected, and the full texts of the selected articles were also reviewed.
- The results of fifteen (15) selected articles showed that 138 *P. aeuroginosa* pathogens were isolated and the antibiotics resistance test against the isolated organism *P. aeuroginosa* were belongs to different classes including: Gentamicin, amoxicillin/clavulanate,erythromycin,cefuroxime,ceftriaxone,ceftazidime,meropenem,ciprofloxacin,nitrofurantoin,piperacillin/tazobactama,cefoxitin

State of Research Problem

- Pseudomonas aeruginosa is a versatile and opportunistic pathogen associated with a wide range of infections, particularly in immunocompromised individuals, and it represents a significant public health concern globally (Peleg et al., 2008).

- In Northern Nigeria, P. aeruginosa has been implicated in a variety of healthcare-associated infections, including respiratory, urinary tract, and wound infections (Okesola et al., 2012).

- Despite various studies conducted in Southern Nigeria, there remains a dearth of comprehensive data on the prevalence, antibiotic resistance patterns, and clinical outcomes associated with P. aeruginosa in Northern Nigeria (Adjei et al., 2020).

Justification of Research

- Healthcare-Associated Infections (HAIs)As a leading cause of HAIs, (ICUs). (Okeke *et al.*, 2019).
- Economic and Public Health Impact The infections caused by P. aeruginosa often require prolonged hospital stays and expensive treatments, imposing a significant economic burden on both families and healthcare systems in Northern Nigeria. (Adamu *et al.*, 2021)
- Prevalence of Antimicrobial Resistance *Pseudomonas aeruginosa* is recognized as a critical pathogen due to its inherent resistance to multiple classes of antibiotics, further complicated by acquired resistance mechanisms. In developing regions like Northern Nigeria, the rise of antimicrobial resistance is attributed to inadequate antibiotic regulation, self-medication, and a lack of diagnostic capabilities (Olaniyan *et al.*, 2020).
- .Environmental Reservoirs and Community Health Northern Nigeria has a unique environment, including irrigated agriculture and variable water quality, that can serve as potential reservoirs for P. aeruginosa. (Yusuf et al., 2020)

Aim and Objectives

The aim of this study is to review previous research conducted on *pseudomonas aeruginosa* isolated from urine sample in different part of Nigeria.

The Specific Objectives are to**:**

- compiled the Prevalence of *pseudomonas aeruginosa* isolated from urine sample reported in different part of Nigeria

- compiled the Antibiotics Resistant patterns of *pseudomonas aeruginosa* isolated from urine sample of different part of Nigeria

Methodology

- Biomedical database (PubMed, Medline, Science Web, Google Scholar), among others were search for relevant publications related to *pseudomonas aeruginosa* reported from different part of Nigeria.
- The research identified different published articles and journals of several studies to compile adequate information on *pseudomonas aeruginosa*, antimicrobial resistance. Moreover the cited references in these review were used to find more relevant articles.

Results

Table 1. Prevelance of *pseudomonas aeruginosa* in Diference *part of Nigeria*

STATE	SAMPLE SIZE	UTI(%)	REFERENCE
Global	1990-2019	(33%)	(WHO,2024)
Kaduna	225	(25%)	(Garba *et al.*,2012)
Niger	150	(7.02%)	(Sulaiman and Alfa, 2022)
Benin	200	(54.16%)	(Peter *et al.*,2020)
Borno	120	(%16.2)	(Abdu *et al.*,2018)

Results cont'd…

Table 2. Prevalence of *pseudomonas aeroginosa* different part of Nigeria

STATE	SAMPLE SIZE	UTI(%)	REFERENCE
Sokoto	320	(8.8%)	(Ahmad *et al.*, 2020)
Kwara	230	(31.7%)	(Oluwagunke *et al.*,2013
Kogi	120	(10.2%)	Kehinde *et al.*, 2021)

Results cont'd…

Table 3. Antibiogram study of *pseudomunas aeruginosa* in different of Nigeria

STATE	ANTIBIOTICS RESISTANCE	PERCENTAGE(%)
KEBBI	aztreonam cefotaxime Tigecycline Ciprofloxacin	82.3 81.5 10.0 33.3
MINNA	Streptomycin Ofloxacin Cefalexin Gentamicin	100 100 49.2 50.9
BORNO	Ampicillin Ceftriaxone Ciprofloxacin Gentamycin	64.0 48.0 54.0 36.0

Results cont'd…

Table 4. Antibiogram study of pseudomunas aeruginosa in different part of Nigeria

STATE	ANTIBIOTICS RESISTANCE	PERCENTAGE(%)
BENUE	Ceftriaxone Chloramphenicol sulphamethoxazole/trimeth oprim Ciprofloxacin	86.4 9.1 95.5 13.6
OYO	Ampicillin Gentamicin Trimethoprim	61.0 97.0 99.0
KWARA	Tetracycline Erythromycin Augumentin Sparfloxacin	90.0 70.0 20.0 80.0
NASARAWA	Septromycin Pefloxacin Nalidixic acid	77.3 27.3 36.4

Discussion

- *P. aeruginosa* metabolically is versatile bacterium that can cause a wide range of severe opportunistic infections such as(pneumonia, salmonella infection, candidiasis, tuberculosis)
- The emergence and increasing rate of MDR *pseudomunas aeruginosa* is challenging the ability to treat community acquired infections (Oloruntoba *et al*., 2020).
- This is because *pseudomunas aeruginosa* can colonize multiple sites in human and animal bodies, thereby horizontally transmitting or acquiring resistance antimicrobial genes
- Nevertheless the differences in the prevalence might have been due to sample size variation, Hospitals environmental conditions and demographic characteristics of the studied participants.

Conclusion

- Antibiotics treatment should be provided after isolation, identification, characterization and antimicrobial sensitivity test.
- It affect a population which indicate as a health problem in Nigeria with implication on health expenses and quality of life.
- Urinary Tact Infection is a polymicrobial infection caused by both Gram positive and Gram negative bacteria.

Recomendetion

✓Its recommended that continue surveillance of resistant rate among bacteria isolate causing UTI is needed to ensure proper recommendation for the treatment of the disease.

(Ali *et al*., 2018).

Reference

✓Abdulrasheed Abdu1, Mohammed Kachallah and Dalhatu Yusuf Bolus, (2017).Antibiotic susceptibility patterns of Uropathogenic *Escherichia coli* among patients with urinary tract infections in a tertiary care hospital in Maiduguri, North Eastern, Nigeria. Journal of Bioscience and Biotechnology Discovery Volume 3(1), pages 14-24.

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✓Mohammed, S., Anup, K. and Anil, K.R. (2011): Identification of *Escherichia coli* through

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