PATIENT'S SAFETY

ANTIBIOTIC SUSCEPTIBILITY OF ESCHERICHIA E COLI

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ABSTRACT

- Antibiotic resistance is a major global health threat, which requires prompt attention
- The rapid emergence of antibiotic resistance is attributed both to the overuse or misuse of antibiotics as well as the lack of innovation in the development of new antibiotics in recent years.
- Therefore, there is a need to monitor the appropriate use of antibiotics, as well as to reduce inappropriate antibiotic prescribing via AMS program.
- In KPJ Klang, a multidisciplinary AMS team is formed with the intention of commencing stewardship activities. As discussed during the 1st AMS meeting, the team aims to initiate stewardship rounds focusing on carbapenem cases.
- Carbapenem had been chosen as the antibiotics of concern since the increasing carbapenem-resistant Enterobacterales (CRE) rate was hypothesized to be attributed to the increased in the imprudent use of carbapenem.

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INTRODUCTION

- Escherichia coli (E. coli) is a common gut microbiome of human and animal, but can also be found in water, soil and vegetation.
- It is the leading pathogen causing urinary tract Infection (UTI), and is among the most common pathogens causing bloodstream infection (BSI), wound infection, otitis media and other complications in human.
- E. coli also the most common cause of acute gastroenteritis in human.
- The overall susceptibility patterns of E. coli isolates from various clinical sources at KPJ Klang will be discussed in this article.

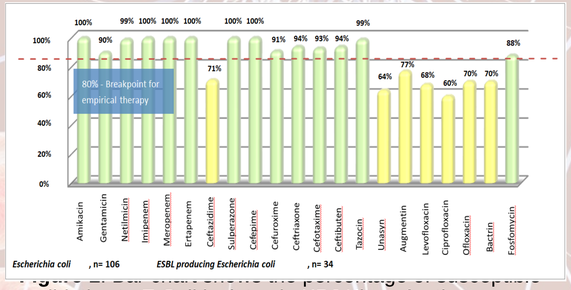
METHODS AND MATERIAL

- Retrospective descriptive analysis of data collected from the registered specimen at KPJ Klang Specialist Hospital from January until December 2022.

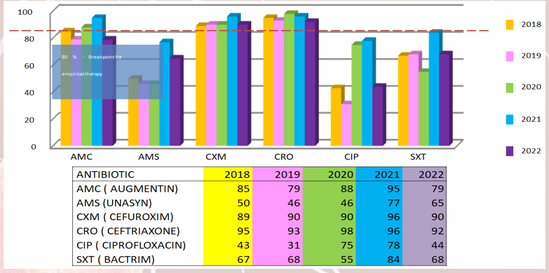
RESULTS

- A total of 106 E. coli including 34 of ESBL-producing E. coli were isolated in year 2022 from a total of 2868 specimen tested.
- Majority of E. coli isolates are derived from urine, 58 samples, Blood 13 samples and Pus 12 samples.
- Susceptibility of antibiotic at 80% and above is the breakpoints standard set up by LABLINK as the basis of antibiotic selection for empirical therapy (Note – Based on the Infectious Diseases Society of America (IDSA) breakpoints standard for the treatment of Acute Uncomplicated Cystitis).
- In all clinical samples, E. coli showed high susceptibility rates (Sensitivity >80%) to Amikacin, Gentamicin, Netilmicin, Cefepime, Sulperazone, Cefuroxime, Ceftriaxone, Cefotaxime and Fosfomycin. **[Figure 1]**
- Five years trending data (2018-2022) for Augmentin, Cefuroxime, and Ceftriaxone showed susceptibility rates above 80%, except for 2019 and 2022(Augmentin at 79%). **[Figure 2]**
- Susceptibility to Carbapenems group of antibiotic, eg. Imipenem (100%), Meropenem (100%) and Ertapenem (100%), were excellent. No Carbapenemases-producing E. coli isolated.
- Escherichia coli showed low susceptibility rates (70% (2020&2021) to 44% in 2022.
- ESBL-producing E. coli (24%) is the most significant alert organism isolated. Five years trending data for ESBL producing E coli rates showed slight reduction from 41% in 2021 to 32% in 2022.

GRAPH AND TABLE



antibiotics to E.Coli isolates in KPJ Klang for the year 2022



ANTIBIOTIC	2018	2019	2020	2021	2022
AMC (AUGMENTIN)	85	79	88	95	79
AMS (UNASYN)	50	46	46	77	65
CXM (CEFUROXIM)	89	90	90	96	90
CRO (CEFTRIAXONE)	95	93	98	96	92
CIP (CIPROFLOXACIN)	43	31	75	78	44
SXT (BACTRIM)	67	68	55	84	68

Figure 2: Bar chart and table show 5 years trending of antibiotics sussectibility rates of Augmentin, Unasyn, Cefuroxim, Ceftriaxone, Ciprofloxacin, Bactrim to E. coli isolates at KPj Klang Specialist Hospital

DISCUSSION

- The results of this report shows high rates of Amikacin, Gentamicin, Netilmicin, Cefepime, Sulperazone, Cefuroxime, Ceftriaxone, Cefotaxime, Fosfomycin, Imipenem, Meropenem and Ertapenem susceptibility to E. coli. However E. Coli susceptibility to for Augmentin, Ceftazidime, Ofloxacin, Bactrim, Levofloxacin ,Unasyn and Ciprofloxacin show high rates of antimicrobial resistance. ESBL-producing E. coli is a significant community acquired alert organism isolated. At individual level, clinician can use this information to guide them in selecting appropriate antibiotics for daily clinical practices. At the institutional level, the antimicrobial stewardship (AMS) team can utilize the data to plan and streamline their AMS strategies and activities.

CONCLUSIONS

- Increasing rates of antimicrobial resistance among E. coli is a growing concern at KPJ Klang Specialist Hospital. It is highly recommended for clinician to submit relevant sample for culture and sensitivity tests before prescribing any antibiotics in order to support antimicrobial stewardship (AMS).

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