ANTIBIOTICS RESISTANCE SITUATION OF *KLEBSIELLA* SPP. ISOLATED AT NINH THUAN PROVINCIAL GENERAL HOSPITAL

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Objectives: Surveylance of the rate of *Klebsiella* spp. Pathogens were isolated from clinical specimens and assessed antibiotic resistance of *Klebsiella* spp. through antibiogram.

Subjects and methods: All *Klebsiella* spp. isolated from clinical specimens of patients treated at Ninh Thuan Provincial General Hospital from October 1/2022 to September 30, 2023: Sputum, pus, blood, bronchial fluid, pharyngeal fluid, cerebrospinal fluid, urine Research of Horizontal cut representation.

Results and conclusions: During the study period, the number of specimens containing *Klebsiella* spp. at Ninh Thuan Provincial General Hospital was 98 samples. The proportion of *Klebsiella* spp. Isolates according to gender: Male was 63.3%, more dominant than Female was 36.7%. The proportion of *Klebsiella* spp. Isolates by age group predominate in the 50 - 70 age group with a rate of 43.9%. *Klebsiella* spp. Mainly distributed on pus specimens accounted for 32.7%, sputum accounting for 27.6%, blood accounted for 25.5%. *Klebsiella* spp. has an ESBL birth rate of 8.2%. *Klebsiella* spp. has resistance to most antibiotics. Especially, ampicillin (100%), bactrim (93.8%), tetracycline (84.7%), cefuroxime (73.5%).

Keywords: *Bacteria Klebsiella* spp., antibiotic resistance.

INTRODUCTION

Amongcarbapenem-resistant*Enterobacteriaceae* strains, *Klebsiella* spp. is the main bacteria recorded through many studies around the world[7]. Faced with the above context, many studies have been conducted to evaluate the resistance of *Klebsiella* spp. in each region, and at the same time find solutions to this global problem. However, up to now, there is no optimal and comprehensive strategy to treat infections caused by *Klebsiella* spp. caused by carbapenem resistance[8].

At Ninh Thuan Provincial General Hospital, the results of surveying the antibiotic resistance situation of some bacteria isolated from the hospital's Microbiology Department, especially *Klebsiella* spp strains that often appear in samples. specimens. Therefore, we conducted a survey "Antibiotic resistance situation of *Klebsiella* spp. isolated at Ninh Thuan Provincial General Hospital" with The objective of the study: surveylance of the rate of *Klebsiella* spp. Pathogens isolated from clinical specimens and assessed antibiotic resistance of *Klebsiella* spp. through antibiogram.

MATERIAL AND METHOD

Research Method: Horizontal cut representation.

Subjects: All strains of *Klebsiella* spp. isolated from clinical specimens sent to the Microbiology Department, Department of Biochemistry - Microbiology, Ninh Thuan Provincial General Hospital.

Inclusion criteria: Select only strains of *Klebsiella* spp. isolated from valuable specimens (for example, sputum specimens: White blood cells > 25, epithelial cells < 10 on a microscopic field x 100;

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urine specimens when the amount of bacteria > 104 CFU/mL... The bacteria strain *Klebsiella* spp. was subjected to antibiograms with existing antibiotics in the conditions of Ninh Thuan Provincial General Hospital from October 1, 2022 to September 30, 2023.

Exclusion criteria: For contaminated specimens; Cases without antibiogram results; Do not take strains of *Klebsiella* spp. isolated from environmental surveys to monitor infections (eg from hospital staff hand swabs, operating room air cultures, hand sanitizer cultures, instrument cultures...).

Place and duration of study: At the Microbiology Department, Department of Chemistry and Microbiology of Ninh Thuan Provincial General Hospital from October 1, 2022 to September 30, 2023.

Sample size and sampling methods

- Complete collection, including all results of *Klebsiella* spp. of the Department of Biochemistry and Microbiology of Ninh Thuan Provincial General Hospital from October 1, 2022 to September 30, 2023.

- Bacterial strains *Klebsiella* spp. isolated from specimens such as: Sputum, pus, blood, bronchial fluid, pharyngeal fluid, cerebrospinal fluid, urine, other fluids (peritoneal fluid, pleural fluid).

Specimens: All strains of *Klebsiella* spp. was positively isolated from specimens taken from patients treated at the Departments of Ninh Thuan Provincial General Hospital

Test technique: According to Kirby-Bauer technique or on BD Phoenix 100 bacterial identification and antibiogram machine.

Data processing and analysis

- Data collection: Data were entered using Epidata 3.1 software.

- Data analysis: Using Stata 14.0 software and descriptive statistical methods.

RESULTS AND DISCUSSION

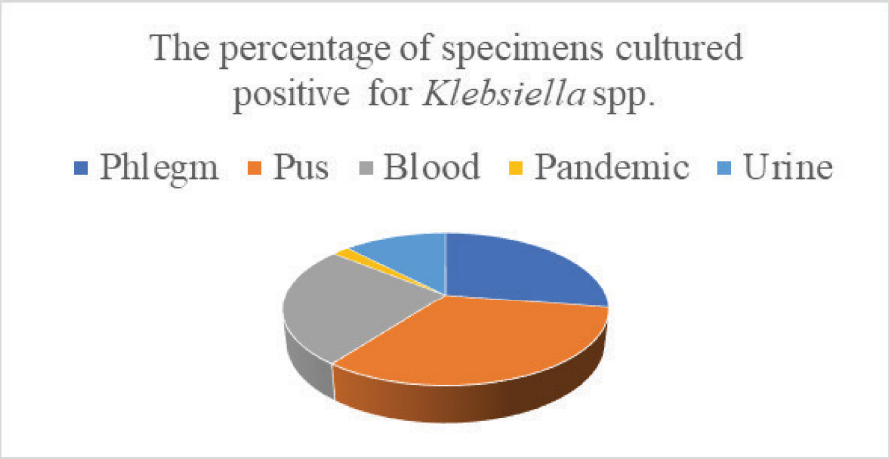

Chart 1. Percentage of cultured specimens isolated

During the study period, the number of specimens containing *Klebsiella* spp. were: 32 Pus samples (32.7%), 27 Sputum samples (27.6%), 25 blood samples (25.5%), 12 urine samples (12.2%), 02 Fluid samples (2%). Our results are similar to the studies of Pham Thi Hoai An and colleagues (2014), during the period from June 1 to June 2014, 35 strains of *Klebsiella pneumoniae* were isolated, of which 24 strains were isolated from sputum specimens. and pus, each type of specimen accounted for 34.29%, urine specimens isolated 9 strains accounting for 25.71%, blood specimens isolated 2 strains accounting for 5.71%. In the cerebrospinal fluid, the causative agent *Klebsiella pneumonia*[1] was not found; Bui Nghia Thinh and Associates (2010), There were 184 patients who met the criteria to be included in the study. From these patients, we collected 476 specimens, mainly sputum (229 samples), blood (152 samples) and urine (67 samples)[6].

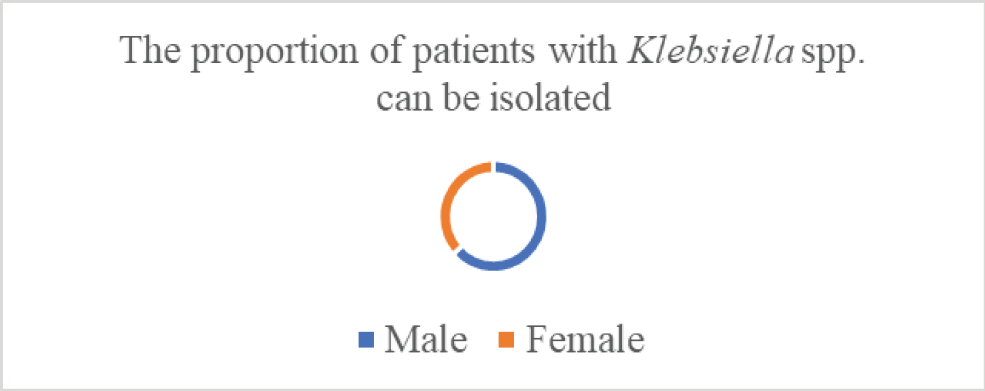

Chart 2. The proportion of patients with *Klebsiella* spp. can be isolated

Over the study period, the number of people with *Klebsiella* spp. isolated in Men were 62 people (63.3%), in Women were 36 people (36.7%). Our research results are close to those of authors Pham Thi Hoai An and colleagues (2014), during the period from June 1 to June 2014, isolated 35 strains of *Klebsiella pneumonia*, of which 26 male patients accounted for 74.29%, nearly 3 times more *Klebsiella pneumonia* was isolated. times the proportion of female patients (with 09 specimens) accounting for 25.71%[1]; Ngo The Hoang and Que Lan Huong at Thong Nhat Hospital in Ho Chi Minh City (57% of men were infected with *Klebsiella pneumonia*)[2]; Bui Nghia Thinh and Associates (2010). There were 184 patients who met the criteria to be included in the study, including 94 men and 90 women[6].

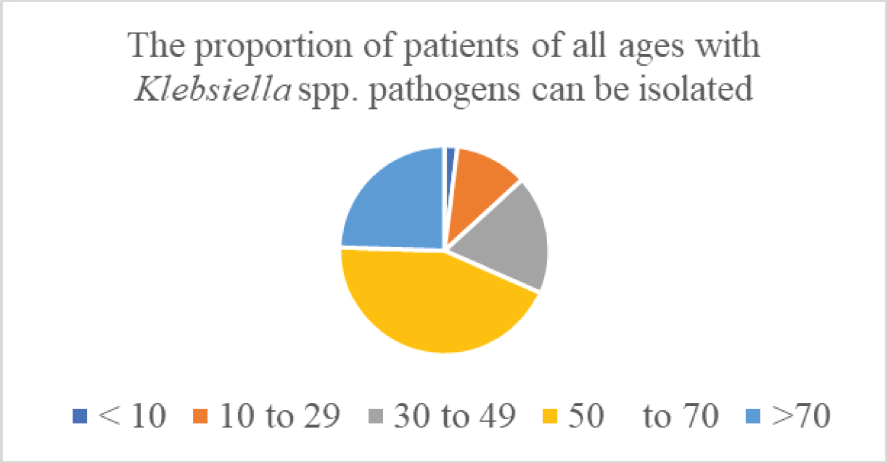

Chart 3. The proportion of patients of all ages with *Klebsiella* spp. pathogens can be isolated

During the study period, the number of people of all ages with strains of *Klebsiella* spp. such as: Age 50 to 70 has 43 people (43.9%), age > 70 years has 24 people (24.5%), age 30 to 49 has 18 people (18.4%), age 10 to 29 years old, there are 11 people (11.2%), those under 10 years old have 2 people (2%). Our research results are similar to the studies of Pham Thi Hoai An and colleagues (2014), the highest rate of *Klebsiella pneumoniae* infection is at the age of 46 - 60 with 11 patients accounting for 31.43%, followed by In the age group from 31 - 45 years old, there are 8 patients, accounting for 22.86%, and the lowest age group is 0 - 15 years old, there are 02 patients, accounting for 5.71%1; Bui Nghia Thinh and Associates (2010), There were 184 patients who met the criteria to be included in the study, with an average age of 67.6 (the youngest was 18 years old, the oldest was 101[6].

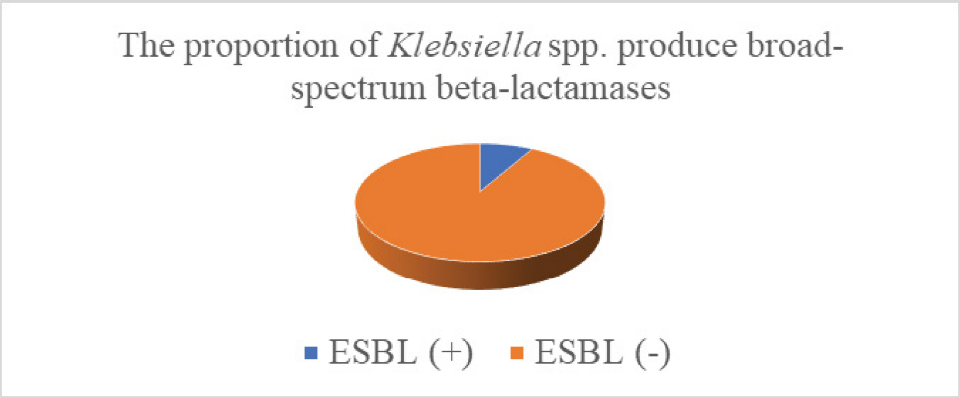

Chart 4. The proportion of *Klebsiella* spp. produce broad-spectrum beta-lactamases

During the study, the number of strains of *Klebsiella* spp. not producing ESBL(-) is 90 (91.8%), the number of strains of *Klebsiella* spp. ESBL(+) birth rate was 08 (8.2%). This result is different from the study of Pham Thi Hoai An and colleagues (2014), there are 23 strains of Klebsiella pneumonia producing extended-spectrum beta-lactamase, accounting for 65.71%[1].

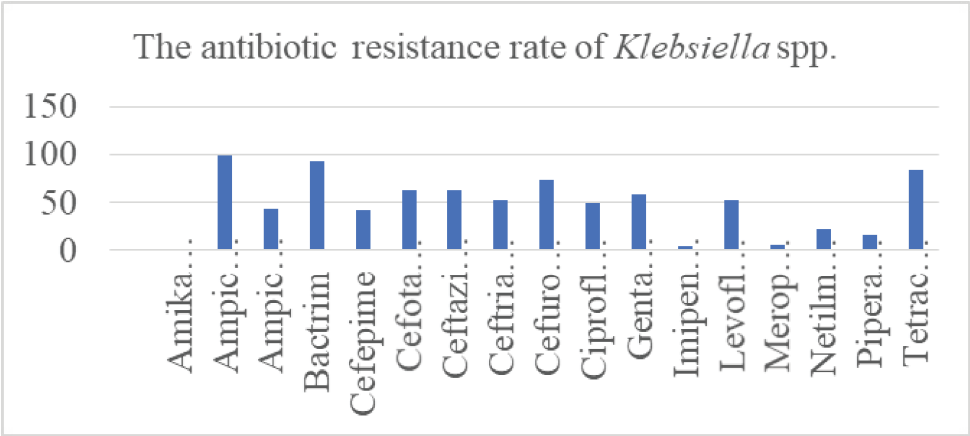

Chart 5. The antibiotic resistance rate of *Klebsiella* spp.

Research results show that *Klebsiella* spp. resistant to ampicillin (100%), bactrim (93.8%), tetracycline (84.7%), cefuroxime (73.5%), ceftazidime (63.9%), cefotaxime (63.3%), gentamicin (58.2%), levofloxacin (52.6%), ceftriaxone (52%), ampicillin/sulbactam (43.9%), cefepime (41.8%), netilmicine (22.4%), piperacillin/tazobactam (17%), meropenem (5.3%), imipenem (5.1%). Our research results are similar to the research results at Thong Nhat Hospital in Ho Chi Minh City in 2011 by Dang My Huong showed that *Klebsiella* was 28.95% resistant to tazocin, 15.79% resistant to amikacin, and 10.53% resistant to Imipenem and meropenem[3]; Research by L.B. Lien and Associates (2016) shows that *Klebsiella* spp. resistant to ceftazidime 78.6%, cefuroxime 69.2%, gentamicin 66.8%, cefepime 62.5%, cefotaxime 61.3%, ciprofloxacin 55.9%, meropenem 33.9%, imipenem 17.7%[4]; Research by Tran Thi Thanh Nga at Cho Ray Hospital in 2013 showed that *Klebsiella* is highly resistant to all currently used antibiotics, only sensitive to the carbapenem group at the level of 30%[5].

CONCLUSIONS

The number of specimens containing the bacteria strain *Klebsiella* spp. at Ninh Thuan Provincial General Hospital is 98 samples. The proportion of *Klebsiella* spp. Isolates according to gender: Male was 63.3%, more dominant than female was 36.7%. The proportion of *Klebsiella* spp. Isolates by age group predominate in the 50 - 70 age group with a rate of 43.9%. *Klebsiella* spp. Mainly distributed on pus specimens accounting for 32.7%, sputum accounting for 27.6%, blood accounting for 25.5%. *Klebsiella* spp. had an ESBL birth rate of 8.2%. *Klebsiella* spp. had resistance to most antibiotics. Especially, ampicillin (100%), bactrim (93.8%), tetracycline (84.7%), cefuroxime (73.5%).

RECOMMENDATION

Bacteria *Klebsiella* spp. There is a very high rate of resistance and multi-resistance to antibiotics. It is necessary to continue to conduct further research on the changes of this drug-resistant bacterial strain. At the same time, convey research results to policy makers and clinicians to develop effective intervention programs that actively contribute to the prevention of bacterial antibiotic resistance and effective treatment. for sick people.

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