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A DESCRIPTIVE COMPARISION STUDY OF EFFECTIVENESS OF CEPHALOSPORINS AND PENCILLIN ANTIBIOTICS IN COMMUNITY ACQUIRED PNEUMONIA IN CHILDREN LESS THAN 5 YEARS IN TERTIARY CARE HOSPITAL

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ABSTRACT

Aim: The aim of the study is to compare and determine the effectiveness of cephalosporin and penicillin antibiotics in CAP in children younger than 5 years. **Objective**: The objective of the study is to determine the effectiveness of antibiotics (cephalosporins and penicillins) in community-acquired pneumonia in the paediatrics department. Comparing the effectiveness of antibiotics (cephalosporins and penicillins) and evaluating the treatment outcomes in children less than 5 years with community-acquired pneumonia at a tertiary care centre in Kurnool. **Methods**: This is a descriptive comparison study conducted at the inpatient paediatric department at Government General Hospital, Kurnool. Over the study period of six months, the collected data is absorbed, monitored, recorded using a clinical profile from medical records, and documented for further study. The study was carried out based on the inclusion and exclusion criteria. **Conclusion:** In this study, we have compared and evaluated the effectiveness of antibiotics (cephalosporins and pencillins) and treatment outcomes in community-acquired pneumonia patients based on time of recovery, length of hospital stay, and measured symptom relief.

KEYWORDS: Antibiotics, cephalosporins, and pencillins for community-acquired pneumonia.

I.INTRODUCTION

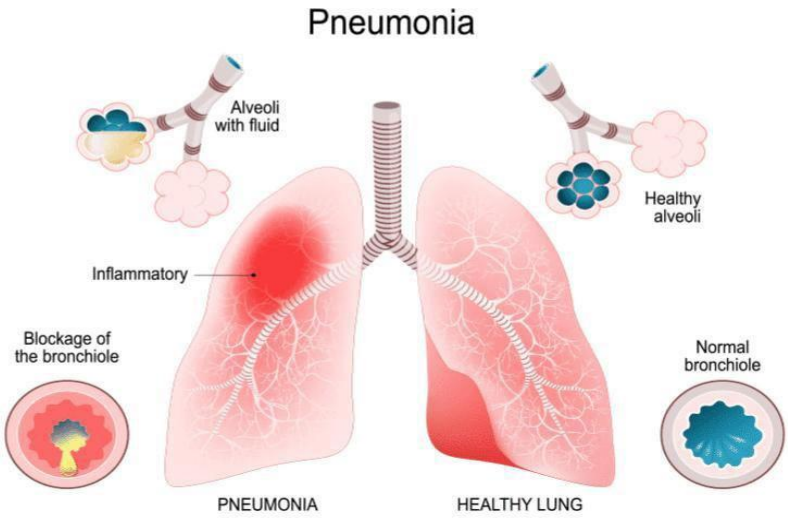
Bronchopneumonia is the most common clinical manifestation in paediatric patients; it is a common infectious cause in children under five years of age. It continues to be the biggest killer worldwide in pediatric population.[1] Pneumonia is a form of acute respiratory infection that affects the lungs. The lungs are made up of small sacs called alveoli, which are filled with air in healthy people. When an individual has pneumonia, the alveoli are filled with pus and fluid, which makes breathing painful and limits oxygen intake.

Bronchopneumonia is an infection that affects the air passages going into the lungs, also known as the bronchi. This condition is mainly caused by bacterial, viral, and fungal infections.

Pneumonia can be spread in a number of ways by the virus and bacteria that are commonly in a child's nose or throat. Can infect the lungs if they are inhaled. They may also spread via airborne droplets. Cough or sneeze. In addition, pneumonia may spread through the body, especially during and shortly after birth. More research needs to be done on the different pathogens causing pneumonia. And the ways they are transmitted, as this is of critical importance for treatment and prevention.

Community-acquired pneumonia (CAP) is commonly defined as an acute infection of the pulmonary parenchyma that is associated with at least some symptoms of acute infection, is accompanied by the presence of an acute infiltrate on a chest radiograph or auscultatory findings consistent with pneumonia (such as altered breath sounds and/or localised rale), and occurs in a patient who is not hospitalised or residing in a long-term care facility >14 days before the onset of symptoms. [4]

Pneumonia symptoms can range from mild to severe and may include fever, cough, cold, or fast breathing. It is mainly affected by bacterial, viral, and fungal infections.



Pneumonia is a substantial cause of morbidity and mortality in childhood throughout the world. Immunisations have had a great impact on the incidence of pneumonia caused by pertussis, diptheria, measles, HIV, and S. pneumonia. Where used, bacille calmette guerin (BCG) for tuberculosis has also had a significant impact. More than 4,000,000 deaths occur each year in developing countries due to acute respiratory tract infections. The incidence of pneumonia is more than tenfold higher, and the number of childhood-related deaths due to pneumonia is 2000 times higher in developing countries than in developed countries. 5Number of under 5 years old deaths by disease caused by pneumococcus, pneumococcus is the leading cause of death in children under 5 years.6 Community-acquired pneumonia can be caused by an extensive list of agents that include bacteria, viruses, fungi, and parasites.

II. AIM AND OBJECTIVE

Aim

The study mainly aims to compare and determine the effectiveness of cephalosporins and other groups of antibiotics in community-acquired pneumonia in children less than 5 years of age in the paediatric department.

Objective

- Determining the effectiveness of cephalosporins in community-acquired pneumonia [CAP] in children less than 5 years
- Determining the effectiveness of pencillins in CAP in children less than 5 years
- Comparing the effectiveness between cephalosporins and pencillins in CAP
- Evaluating the treatment outcomes in CAP

III. METHODOLOGY

Methodology

This study is a descriptive comparison study, and the subjects involved are the inpatient paediatric department at Government General Hospital, Kurnool.

Study design: A Descriptive Comparison study.
Study site: Department of Pediatrics, Government General Hospital, Kurnool.
Study duration: The study will be performed for 6 months.
Sample size: 90
Study materials: Patient data collection Proforma.

Inclusion criteria

- Patients newly diagnosed with Community acquired pnuemonia.
- Patients of both sex and age group 2 months to 5 years were included in our study.
- All the subjects of community acquired pneumonia based on WHO guidelines.

Exclusion criteria

- Subjects of age group less than 2 months.
- Patients with coronary heart disease, chronic lung diseases.
- Patients with known history of pneumonia.
- Subjects with chronic disabling comorbidity and immunodeficiency.
- Sick with hospital acquired pneumonia.

IV. RESULTS

The study group was 90 patients; all of them met the inclusion criteria.

Gender Wise Distribution For Total Study

Out of 90 The cases collected and analyzed the majority of gender distribution was found to be on males with 59(65.5%) followed by females 31(34.4%) which is represented in table and figure.

Tab.1:-Gender Wise Distribution.

GENDER	NUMBER	PERCENTAGE %
MALE	59	65.5%
FEMALE	31	34.5%

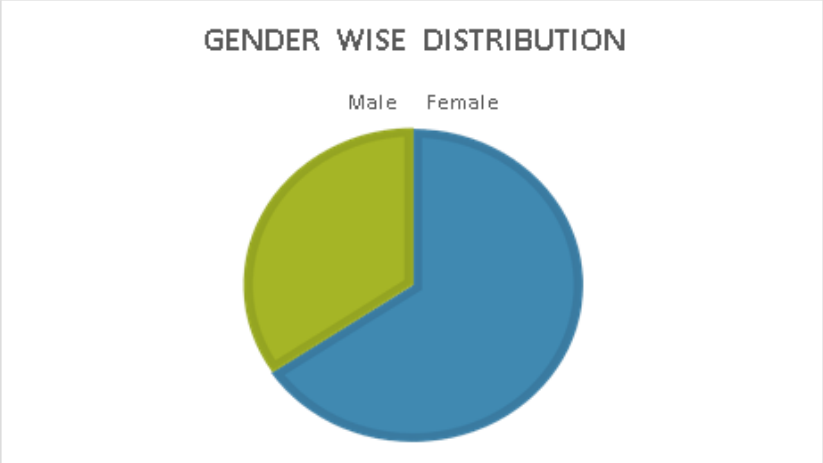


Fig.1:-Gender Wise Distribution,

Age Wise Distribution for Total Study

Age distribution of total study was found to be below 1 year of age 39 (43.3%), followed by 1 to 2 years of age 14 (15.5%), 9 (10%) of cases between 2 to 3 years of age, followed by 11 (12.2%) of cases between 3 to 4 years of age, 11 (12.2%) of cases between 4 to 5 years of age, followed by 5 years of age 6 (6.6%). Which is represented in the table and figure.

Tab.2:-Age Wise Distribution.

AGE	NUMBER	PERCENTAGE%
<1	39	43.3%
1	14	15.5%
2	9	10%
3	11	12.2%
4	11	12.2%
5	6	6.6%

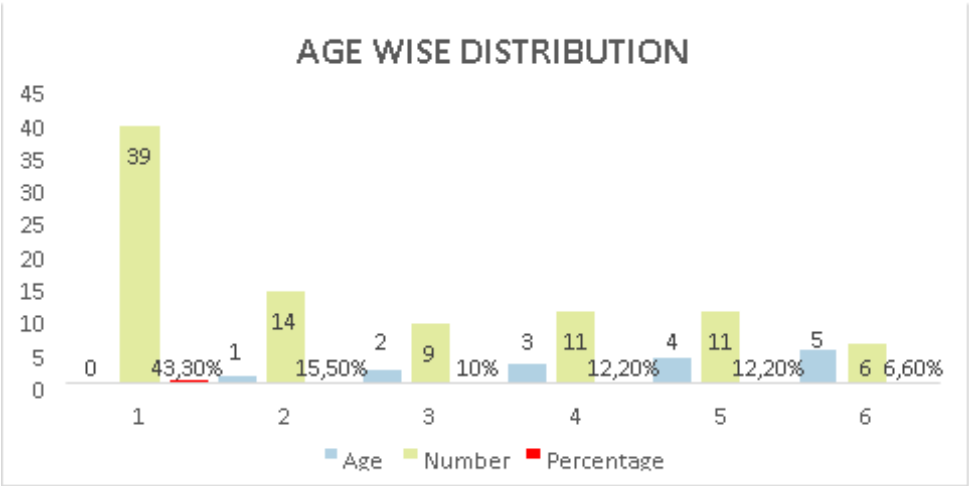


Fig.2:-Age Wise Distribution.

Age Wise Distribution in Males

A total of 90 cases was collected in that 59 cases of males were observed and analysed. The majority of age distribution of total study in males was found to be below 1 year of age 26 (44.06%), followed by 1 to 2 year of age 12 (20.33%), 6 (10.1%) between 2 to 3 years, followed by 5 (8.47%) between 3 to 4 years, 7 (11.86%) between 4 to 5 years, followed by 3 (5.08%) for 5 years of age. Which is represented in table and figure.

Tab.3:-Age Wise Distribution in Males.

MALE AGE	NUMBER	PERCENTAGE
<1	26	44.06%
1	12	20.33%
2	6	10.1%
3	5	8.47%
4	7	11.86%
5	3	5.08%

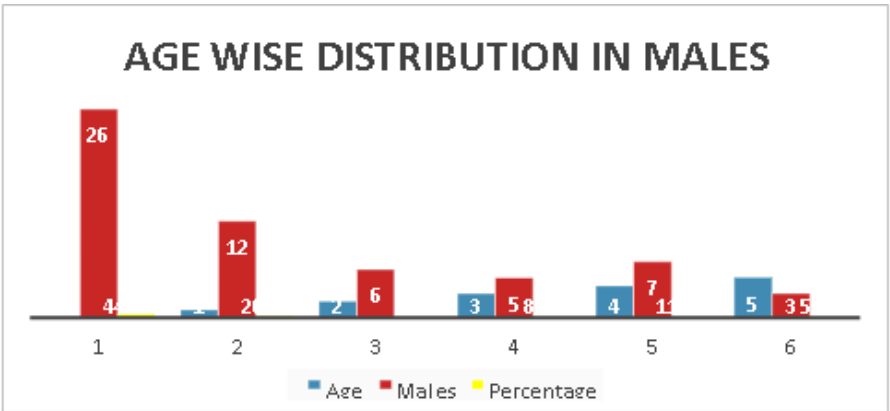


Fig.3:-Age Wise Distribution In Males,

Age Wise Distribution in Females

Among 90 cases the highest patient suffering with bronchopneumonia of age distribution of total study in females was found to be below 1 year of age 13 (41.93%), followed by 2 (6.45%) for 1 year of age, 3 (9.67%) between 2 to 3 years of age, followed by 6 (19.35%) between 3 to 4 years of age, 4 (12.90%) between 4 to 5 years of age, followed by 3 (9.67%) for 5 years of age. Which is represented to be in table and figure

Tab.4:-Age Wise Distribution in Females.

FEMALE AGE	NUMBER	PERCENTAGE
<1	13	41.93%
1	2	6.45
2	3	9.67
3	6	19.35
4	4	12.90
5	3	9.67

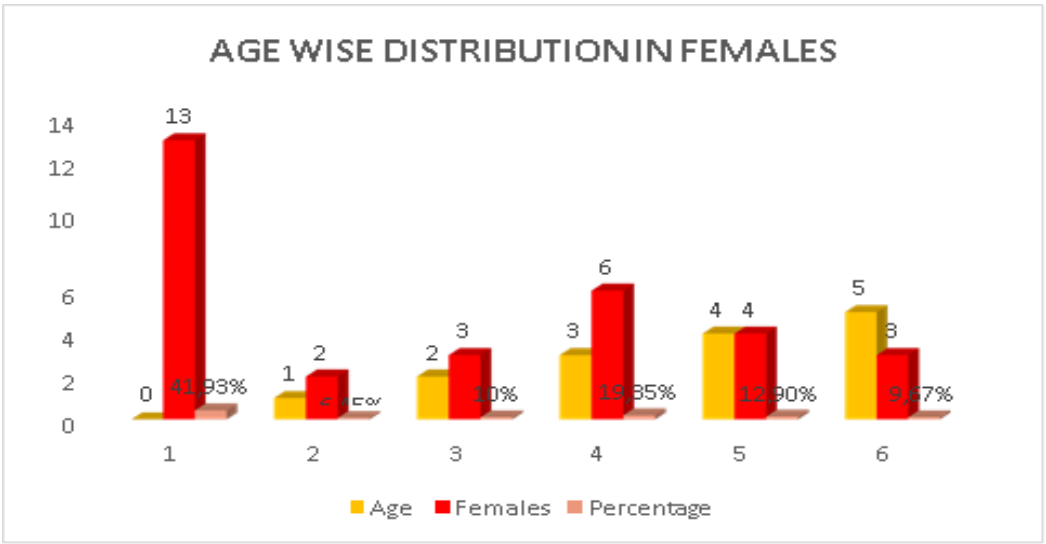


Fig.4:-Age Wise Distribution In Females.

Age Wise Distribution for Cephalosporins

Out of 90 cases, 45 patients were treated with cephalosporins 20 (44.4%) was in the range of age below 1 year, followed by 9 (20.2%) of age between 1 to 2 years, 5(11.1%) between 2 to 3 years, followed by 5(11.1%) between 3 to 4 years of age, 4(8.8%) between 4 to 5 years, followed by 2(4.4%) for 5 years of age.

Tab.4:-Age Wise Distribution for Cephalosporins.

AGE	NUMBER	PERCENTAGE
<1	20	44.4
1	9	20.2
2	5	11.1
3	5	11.1
4	4	8.8
5	2	4.4

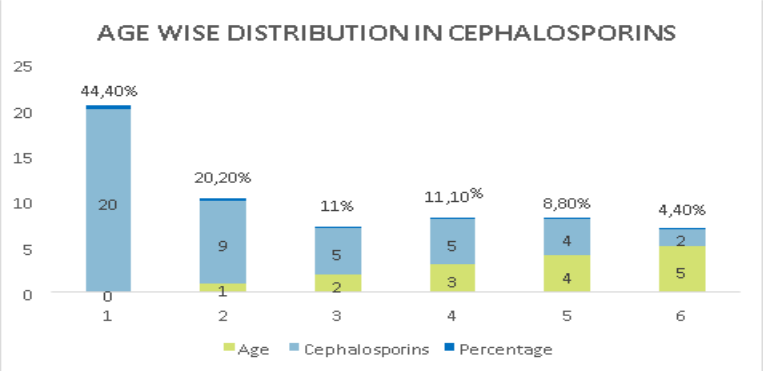


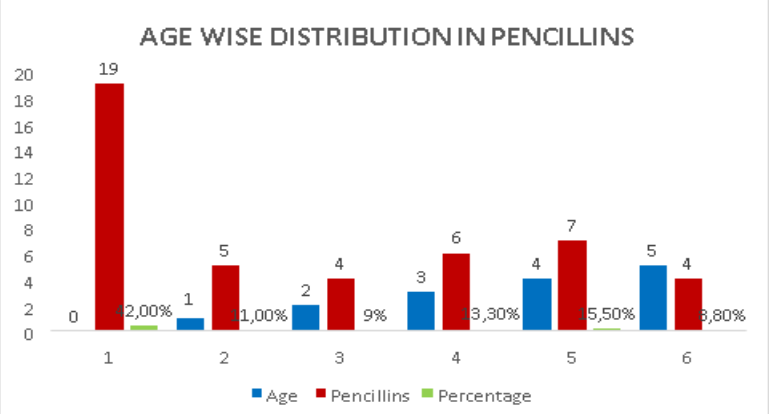
Fig.4:-Age Wise Distribution for Cephalosporins.

Age Wise Distribution for Pencillins

Out of 90 cases, 45 patients were treated with pencillins 19(42.2%) was in the range of age below 1 year, followed by 5 (11.1%) of age between 1 to 2 years, 4(8.8%) between 2 to 3 years, followed by 6(13.3%) between 3 to 4 years of age, 7(15.5%) between 4 to 5 years, followed by 4(8.8%) for 5 years of age.

Tab.5:-Age Wise Distribution For Pencillins.

AGE	NUMBER	PERCENTAGE
<1	19	42.2
1	5	11.1
2	4	8.8
3	6	13.3
4	7	15.5
5	4	8.8



Tab.5:-Age Wise Distribution For Pencillins.

Gender Wise Distribution In Pencillins and Cephalosporins

Out of 90 cases, 45 were treated with cephalosporins and 45 were treated with pencillins. In pencillins majority of gender was found in males 28(62.2%), and females 17(37.7%). In cephalosporins, the majority of gender was found in males 31 (68.8%) and females 14(31.1%).

Tab.6:-Gender Wise Distribution In Pencillins And Cephalosporins.

DRUGS	MALES	FEMALES
Pencillins	28 (62.2%)	17 (37.7%)
Cephalosporins	31 (68.8%)	14 (31.1%)

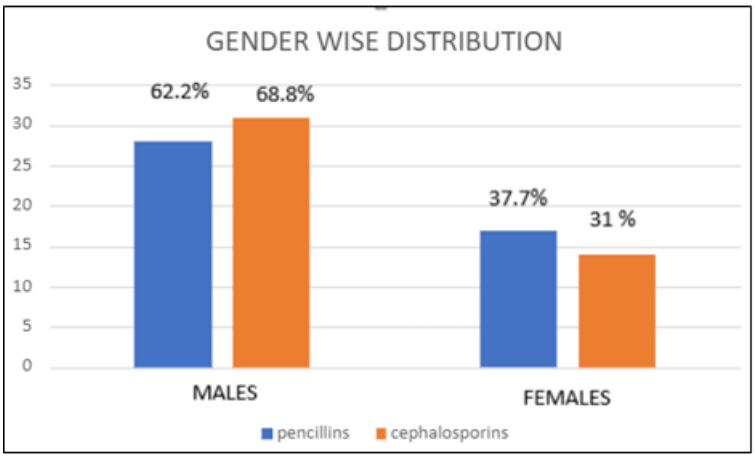


Fig. 6:-Gender Wise Distribution in Pencillins and Cephalosporins Antibiotic Effectiveness Based on Duration of Stay.

Tab.7:-Antibiotic Effectiveness Based on Duration of Stay.

DRUGS	24HRS	24-48HRS	<72HRS	>72HRS
Pencillins	4	19	14	8
Cephalosporins	7	11	19	8

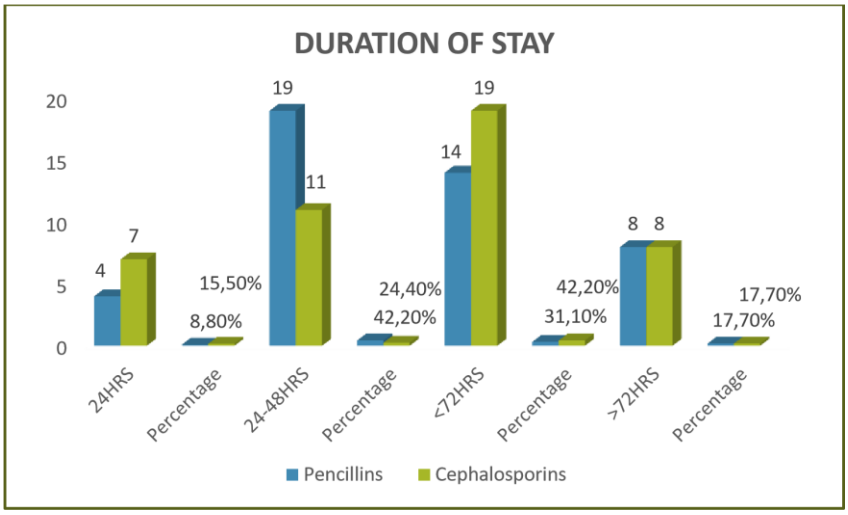


Fig.7:- Antibiotic Effectiveness Based On Duration Of Stay.

V. DISCUSSION

The study of pneumonia always brings controversies. There are areas of uncertainty in the management of CAP such as the difficulty in differentiating viral from bacterial pneumonia, the difficulty in determining the specific etiological agent, and the difficulty in selecting the appropriate antibiotic treatment.[7]

The present work was Descriptive comparison performed to assess the efficacy of antibiotics mainly penicillin's and cephalosporins in patients indicated for CAP (Community Acquired Pneumonia). The study explains about the proper usage and duration of antibiotics. In our study that the males 59 (65.5%) patient are more when compared to females 31(34.5%) patient.[8]

Multiple antibiotics are prescribed for the treatment of pneumonia, often motivated by fear of resistance and the need to ensure a good clinical outcome. Therefore, it is important to know which the best scheme is. The cure and failure rates of CAP depend not only on the choice of antibiotics, it is also important the etiology of pneumonia, the age of the patient and the severity of the disease.[9]

A study conducted on paediatrics' in 90 patients which includes male and female in that we have found both males and females with the age of <1 year, penicillin antibiotics are more effective when compared with cephalosporins.[10]

Age distribution of total study was found to be below

- <1 year age 39(43.3%),
- 1to 2 years of age 14(15.5%),
- 2 to 3 years of age 9 (10%)
- 3 to 4 years of age 11(12.2%)
- 5 years of age 11(12.2%), and
- 5 to 6 years of age 6(6.6%).

Among 90 cases the highest patient suffering with community acquired pneumonia of age distribution of total study in females was found to be

- <1 year age 13 (41.93%),
- 1 to 2 years of age (6.45%),
- 2 to 3 years of age 3 (9.67%),
- 3 to 4 years of age 6(19.35%),
- 4 to 5 years of age 4(12.90%),
- 5 to 6years of age 3(9.67%).

A total 90 cases were collected in that 59 cases of males were observed and analyzed. The majority of age distribution of total study in males was found

- <1 year age 26 (44.06%),
- 1 to 2year age 12 (20.33%),
- 2 to 3 years of age 6 (10.1%),
- 3 to 4 years of age 5 (8.47%),
- 4 to 5 years of age 7 (11.86%),
- 5 to 6 years of age 3(5.08%).

A total of 90 cases were collected and analyzed treatment evaluation was characterized between before treatment and after treatment. A total of 4 symptoms was, polypnea (fast breathing), cold, cough, fever. Included treatment and a total scoring for symptoms was (15) in which mild1 moderate2 moderate severe3 severe4 very severe5. An average score was calculated into 4 groups, based on symptoms which is appeared in patient. Among 90 cases which were treated by penicillin's and cephalosporins with duration of 4-5 days for treating CAP.

Our study explains about the comparison between penicillin's and cephalosporins, in which penicillin's are more effective and duration of hospital stay also decreased was observed.

VI. CONCLUSION

The present study was performed to assess the need of antibiotics in patient indicated for community acquired pneumonia by analyzing the patient data it was concluded that Effectiveness of antibiotics and length of hospital stay was decreased were noticed in the subjects included in the study. When compared to usage of penicillin's and cephalosporins, pencillins are more effective in patient with community acquired pneumonia.

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