Abstract

The *klebsiella pneumoniae* is the most prevalent species isolated from hospitalized patients and it is most prevalent from in patient's isolates in a laboratory-based surveillance. The survey is an important study the spared of the infection in given location. Keeping Bagalkot district as the area of spared we try to study infection. In present study, 350 clinical samples were isolated from different places of Bagalkot district, for convenience, five Zones are made; namely A, B, C, D and E. Out of 350 clinical samples, 230 from males and 120 from females were collected. After performing all biochemical tests 180 isolates were confirmed as Klebsiella pneumonia. The rate of infection high in Bagalkot district. Out of 180 positive isolates, the incidence rate was more in sputum sample 76.00%, followed by 18 %, in blood, 6% in urine samples. The survey report also shows the percentage of incidence was more in the age group of above 40 (66.43%) years and age group between 8 to 18 (56.12%) years.

1. INTRODUCTION

*Klebsiella pneumoniae* is a facultative anaerobic gram negative bacteria when observed under simple microscope and has large round and greenish-yellow colonies often with haemolysis were observed when grown on blood agar plates a small percentage of *klebsiella pneumoniae* can be differentiated from most other pneumonia by the coagulase test, *klebsiella pneumoniae* is primarily coagulase-positive because it can produce the enzyme coagulase that causes clot formation. It causes superficial skin lesions such as boils and furuncles: more serious infections such as pneumonia, lung infection,
meningitis, and liver infection urinary tract infections. *klebsiella pneumoniae* infections may spread through water infection food infections. [1] Deeply penetrating *klebsiella pneumoniae* infections can be severe. Prosthetic joints put a person at particular risk for septic arthritis, colonization or infection in the hospital include prior antibiotic exposure, admission to an intensive care unit, surgery, and exposure to an multi drug resistance *klebsiella pneumoniae* colonized [2]. The focus of this work is to isolate and identify spread of infection in hospitals admitted community. The work is progressed with isolation of bacteria from patients and enumeration of bacteria in primary health centers and admitted patients will able to understand disease. After isolation we try to find its epidemiological spread and we try to distribute the isolate in different zone wise survey and how the infection is spread in different age group. The penicillin for medical use, the first penicillin-resistant *klebsiella pneumoniae* isolates were observed. Since 1960, approximately 70% of all *klebsiella pneumoniae* isolates have been penicillin-resistant [3]. In addition, *klebsiella pneumoniae* developed resistance in, 1981 only three years after its introduction.

2. MATERIALS AND METHODS

2.1. Sample Collection Zones

Isolation and study of epidemiology of *klebsiella pneumoniae* from the infected patients were chosen from five places of Bagalkot district, Karnataka. The Bagalkot district temperature varies between 25 to 43° C. The places were classified in to five Zones as A (District Govt. Hospital, Bagalkot), B (Sri Hangal Kumareshwara Hospital and Research Centre, Bagalkot), C (Miskin Diagnostic Laboratory) D (Govt. Hospital Ilkal) and E (Govt. Hospital Jamakandi). Clinical samples were collected regularly from above mentioned places during March 2013 to December 2015.

2.2. Isolation of *klebsiella pneumoniae* from different clinical samples

2.2.1. Collection of Samples

The clinical samples were collected from the patients who were infected with *klebsiella pneumoniae* in and around Bagalkot region of Karnataka state, India. The clinical specimens like sputum, cerebrospinal fluid (CSF), blood, urine, biomedical waste were selected as the sources of organisms and carried in 18.2% peptone water to the laboratory. Nutrient agar and *Klebsiella* selective media for primary isolation of the *klebsiella pneumoniae*

2.2.2. Media used for isolation and Characterization of *klebsiella pneumoniae*:

For the present study different culture media like, Nutrient agar, *Klebsiella* selective media and Blood agar were used. Nutrient agar/broth was prepared for the appropriate growth of *klebsiella pneumoniae* culture, which could be the source of the strains for inoculation in subsequent steps plates were prepared and streaked; the inoculations could be done either from the peptone water containing organisms or from the nutrient broth culture. The blood agar ingredients were dissolved and autoclave at 121° C for 15 min. Cool to 45-50 °C and 50 ml of sterile defibrinated sheep blood was added aseptically.
Mixed thoroughly, avoiding accumulation of air bubbles and immediately poured into sterile petri plates.

**2.3. Colony Characterization and Microscopic Observation**

Isolated colony from selective media was picked up and prepared the smear on grease free glass slides, which was dried and heat fixed. Gram-staining was performed according Christiana Gram which allows better differentiation of organisms.

**2.4. Biochemical Characterizations of *klebsiella pneumoniae***

For the characterization of isolates, HI Staph Identification kit from Hi-Media Mumbai was used. For biochemical tests, control organisms were used and procured from IMTECH, Chandigarh, India. A set of biochemical tests were performed that would confirm *klebsiella pneumoniae* strains among the isolates. Tests were performed in order to characterize the *klebsiella pneumoniae* in respect to various biochemical properties.

### 3. RESULTS

**3.1. Isolation and Characterization of *klebsiella pneumoniae***

The present investigation was carried out during the period from March 2013 to December 2015. During this period of time epidemiologically important *klebsiella pneumoniae* was isolated from different clinical samples. An effort was made to collect the sample from five different places of Bagalkot region. For convenience, places were classified into five Zones. Total of 350 clinical samples, from 230 males and 120 females were collected. For isolation and identification of *klebsiella pneumoniae*, samples were inoculated on to the selective medium and study its characteristics. Distinguishing colonies grown on both media at 37°C were picked and confirmed by microscopic and biochemical characterization. Out of 350 clinical samples inoculated, 180 strains were confirmed as *klebsiella pneumoniae* and were further characterized. Out of 180 samples, the overall rate of incidence observed in both male and female is 64% and 36 %, respectively.

**3.2. Survey of *klebsiella pneumoniae***

In the present study, the incidence of *klebsiella pneumoniae* were distributed Zone wise and age group wise, are presented in the following sections

**3.2.1. Zone wise incidence of *klebsiella pneumoniae***

The incidence of *klebsiella pneumoniae* of different Zones. It is evident that the incidence of *klebsiella pneumoniae* colonization is very high in Zone-D 72.00% followed by Zone-E 66.66%. In Zone-A 62.5% isolation rates were observed. The lowest rate of incidence was observed in Zone-C and Zone-B with 53.76% and 52.85% respectively [5].

**3.2.2. Age wise incidence of *klebsiella pneumoniae***

The age wise incidence of *klebsiella pneumoniae* colonization of each Zone there was a clear indication of the increase in *klebsiella pneumoniae* incidence with age more than 40 years and between 5-18 years when compared to that age group 18-40 years in both male and female individuals. In Zone-A, maximum rate of *klebsiella pneumoniae* incidence was
recorded in > 40 years (72.22%) age group followed by 5-18 years (60.00%) and minimum incidence was recorded in adults between 18-40 years (57.14%) [5]. In Zone-B maximum rate of *klebsiella pneumoniae* incidence was recorded in > 40 years (64.51%) age group followed by 5-18 years (44.44%) and minimum incidence was observed in 18-40 (41.66%) years of age. In Zone-C, maximum rate of *klebsiella pneumoniae* incidence was recorded in > 40 years (61.29%) age group followed by 59.37 in age group 5-18 years and minimum incidence was recorded in adults between 18-40 years (34.28%). In Zone-D maximum rate of *klebsiella pneumoniae* incidence was recorded in > 40 years (84.61%) age group followed by 70.00% in age group 5-18 years and minimum incidence was observed between 18-40 years (50.00%). In Zone-E maximum rate of *klebsiella pneumoniae* incidence was recorded in > 40 years (68.18%) age group followed by 60.00% in 18-40 years age group and minimum incidence was observed in age group between 5-18 years (57.14%).

### 4. DISCUSSION

In present study, 350 clinical samples were isolated from different places of Bagalkot district, for convenience, five Zones are made; namely A, B, C, D and E. Out of 350 clinical samples, 230 from males and 120 from females were collected. After performing all biochemical tests using standard kit, and specific test the isolates were confirmed as *klebsiella pneumonia*. The prevalence rate of *klebsiella pneumoniae* in Bagalkot District was observed around 58.06%. Out of 180 positive isolates, the incidence rate was more in sputum sample 76.00%, followed by 18 %, in blood, 6% in urine samples. The survey report also shows the percentage of incidence was more in the age group of above 40 (66.43%) years and age group between 8 to 18 (56.12%) years. The prevalence of *klebsiella pneumoniae* in hospital varies considerably from one region to another [7].

Geographic spread of *klebsiella pneumoniae* between countries and continent has been reported previously and proven by molecular evidences. The highest colonization of *klebsiella pneumoniae* was observed in Zone-D with 72% followed by Zone-E with 66.66% and the lowest incidence was observed in Zone-B with 52.85%. Out of 180 positive isolates, the incidence rate was more in sputum samples (76.00%) [8]. The incidence of *klebsiella pneumoniae* isolates were categorized based on age groups. Age group wise incidence of *klebsiella pneumoniae* colonization studies, says that age group above 40 and between 6 to 18 years, the individuals are more prone for *klebsiella pneumoniae* infections [10]. The highest rate of incidence was recorded in above 40 years, in Zone-D with (84.61%), followed by Zone-A with 72.00%, in Zone-E with 68.18%, in Zone-B 64.51% and in Zone-A 50.0% and in Zone-C 61.29%. The age between 6 to 20 years, the highest incidence was recorded in Zone-D (70.00%) followed by in Zone-A 60.00%, Zone-C 59.37%, Zone-E 57.14% and in Zone-B 44.44%. The age between 18-40 years in all five Zones least incidence was observed. The average incidences of *klebsiella pneumoniae* in three age groups. In our investigation the highest incidence was observed
in the age group of above 40 years (66.43%) and age group between 5-18 years, whereas least incidence was observed in the middle age group.

5. CONCLUSION
350 samples were collected from 5 different Zones of Bagalkot district, the present study a total of 180 *Klebsiella pneumoniae* isolates isolated from 350 clinical samples, out of which 230 from males and 120 from females. The isolates are confirmed by all biochemical tests. The incidence of *Klebsiella pneumoniae* in 5 Zones and the highest percentage of incidence were observed in Zone-D with 72% and lowest incidence was observed in Zone-B with 52.85%. Out of 180 positive isolates, the incidence rate was more in sputum sample 76.00%, followed by 18 %, in blood, 6% in urine samples. The survey report also shows the percentage of incidence was more in the age group of above 40 (66.43%) years and age group between 8 to 18 (56.12%) years. The results of age wise distribution of *Klebsiella pneumoniae* in all five Zones were studied and the percentage of incidence was more in the age group of above 40 (66.43%) years and age group between 8 to 18 (56.12%) years.

6. REFERENCES