

**A STUDY ON IMPACT OF AGE AND GENDER ON POST COVID 19
EPIDEMIOLOGY OF *KLEBSIELLA PNEUMONIAE* FROM COVID 19
RECOVERED CASES**

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ABSTRACT

COVID 19 infections resulted in huge impact in the etiology of bacterial infections in patients during post COVID 19 period. In this context, the present study evaluated the post COVID 19 *K. pneumoniae* from both COVID 19 recovered cases as well as from non- COVID 19 cases but infected by *K. pneumoniae*. Cases studied were 696 during the period between July 2022 and December 2022 from three districts namely Madurai, Dindigul and Sivagangai. This article reports the impact of age on COVID 19 infections and the conditions precluding for *K. pneumoniae* infections. Among 696 cases, most number of cases (20%; 139 of 696) was recorded in the month of September 2022 and only 14% (97 of 696) were recorded during the month of December 2022. Among 696 cases, 188 (27% of 696) were from the age group of 21- 30 years and least number of cases was recorded in the age group of 91-100 years old. During the study period, female were observed to be highly infected (68%) by *K. pneumoniae* than by male (32%) patients.

Key words: COVID 19- Age- Sex- *Klebsiella pneumoniae*- infections

INTRODUCTION

Klebsiella pneumoniae are frequently reported among neonates/children, adults as well as elderly persons either as nosocomial or as community associated infections such as urinary tract infections, pneumonia and bacteremia. Remarkably, immuno compromised and patients with prolonged hospitalization predominantly involved with the bacterial infection (Chen et.al., 2020). As emergence of *K. pneumoniae* with multidrug resistance and possession of several virulence factors are common, a successful therapy of *K. pneumoniae* infected cases has been a task. In particular, the clinical significance of pneumonia due to *K. pneumoniae* has currently been a

concern in view of SARS- CoV2 caused COVID 19 pandemic as both cause a highly dreadful and difficult-to- treat lung infection

ETIOLOGY

Klebsiella pneumoniae belongs to the family Enterobacteriaceae. It is an encapsulated bacterium, gram-negative, non-motile and it is rod shaped bacterium and measures 0.3 – 1.5 um width and 0.5 – 5.0um long (Roe et.al., 2019). Oxidase negative bacterium is aerobic but some are facultative anaerobes. It can grow in a normal medium and it doesn't require special medium to grow. The growth temperature of *Klebsiella pneumoniae* is well at 35 – 37 degrees. The capsular polysaccharide of the bacterium is a most important virulence factor. next to capsule, lipopolysaccharide of the bacterium emits an inflammatory compound to the host and causes septic shock. Fimbriae of the bacterium also act as a virulence factor and it allows the bacterium to attach with the host.

MATERIALS AND METHODS

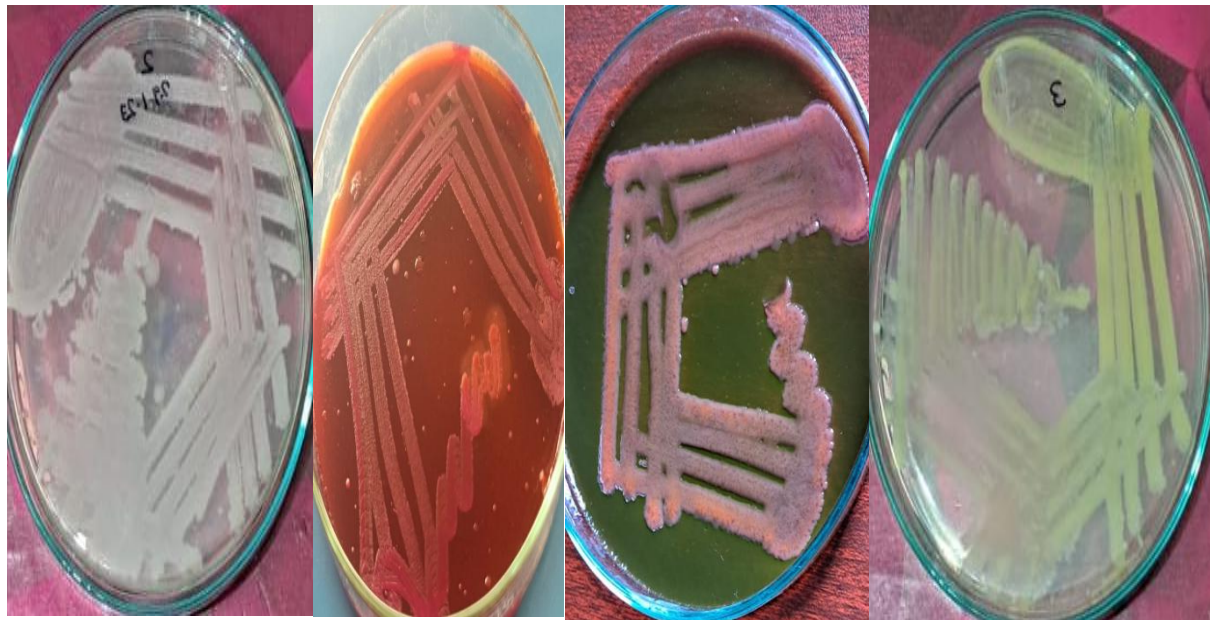
Specimen collection and pathogen identification

A systematic methodology was followed in collection of clinical specimens. Standard procedures was followed by aseptical techniques. Collection of the patient details and the collection of clinical specimens such as pulmonary secretions, urine, pus were collected from post Covid -19 recovered patients. The samples were processed and taken to routine microbiological tests namely simple staining, Gram staining, motility tests and IMViC tests. These tests would be a prelude for the isolation and identification of bacterial pathogens. The dominant pathogen was scored and taken to the confirmatory tests. Confirmation of the bacterial isolates as *Klebsiella pneumonia* was done by Gram staining, motility by hanging drop method. Isolation and confirmation of the bacteria by biochemical characterisation and standard plating in confirmatory media.

RESULTS AND DISCUSSION

Isolation and identification of bacteria was done by standard microbiological methods. Confirmatory tests were done to confirm isolates of by *Klebsiella pneumonia* in the samples. Selective plating was done to confirm the bacterial isolate (Plate 1).

Plate 1- Confirmatory tests for *Klebsiella pneumonia*



The experimental results obtained are discussed in this section. Total sample size in this study was 696 which included both male and female population

MONTH WISE DISTRIBUTION

The total cases taken for this study was 696. The period of collection was from July 2022 to December 2022. The process was initiated during early July since monsoon showers initiate body temperature fluctuation. Collection of samples for these six months revealed a unique trend in which the N value was less than 20 % (Table 1) Least percentage of 14 was observed during December. Highest percentage was recorded in the month of September (20%). The sudden change of weather pattern may be the reason for this increase in percentage. The other months of the sample analysis revealed an intermediate data of 18% in August and 17% in November. The reduction of 5 % between the higher value suggest that there is no significant difference in the infection period with the months. This reveals an uniform pattern of distribution of infection during post COVID 19 periods. Similar results were recorded by Chen et.al., 2020.

Table 1- Month wise distribution

S.NO	PARTICULARS	TOTAL	Percentage
			N=696
1	JULY	108	16%
2	AUG	124	18%
3	SEPTEMBER	142	20%
4	OCTOBER	104	15%
5	NOVEMBER	120	17%
6	DECEMBER	98	14%
	TOTAL	696	100%

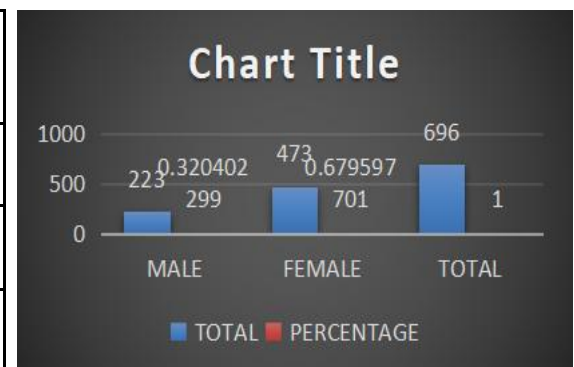


SEX-WISE DISTRIBUTION

This study involves analysis of samples from 696 patients. Differentiation of the samples based on sex revealed a higher proportion of female population being affected during post COVID 19 period (Table 2). Among the sample size of 696, female population was 473 which accounted to 68%. This reveals a higher sensitivity of females to infections by *Klebsiella pneumonia*. There are many pre disposing factors among female population rendering them sensitive to various infections due to COVID 19. Thus this study proves similar facts in which males are better in their resistance to other infections (Turriziani, 2020).

Table 2- Sex-Wise Distribution

S.N	PARTICULAR	TOTAL	PERCENTAGE
1	MALE	223	32%
2	FEMALE	473	68%
	TOTAL	696	100%

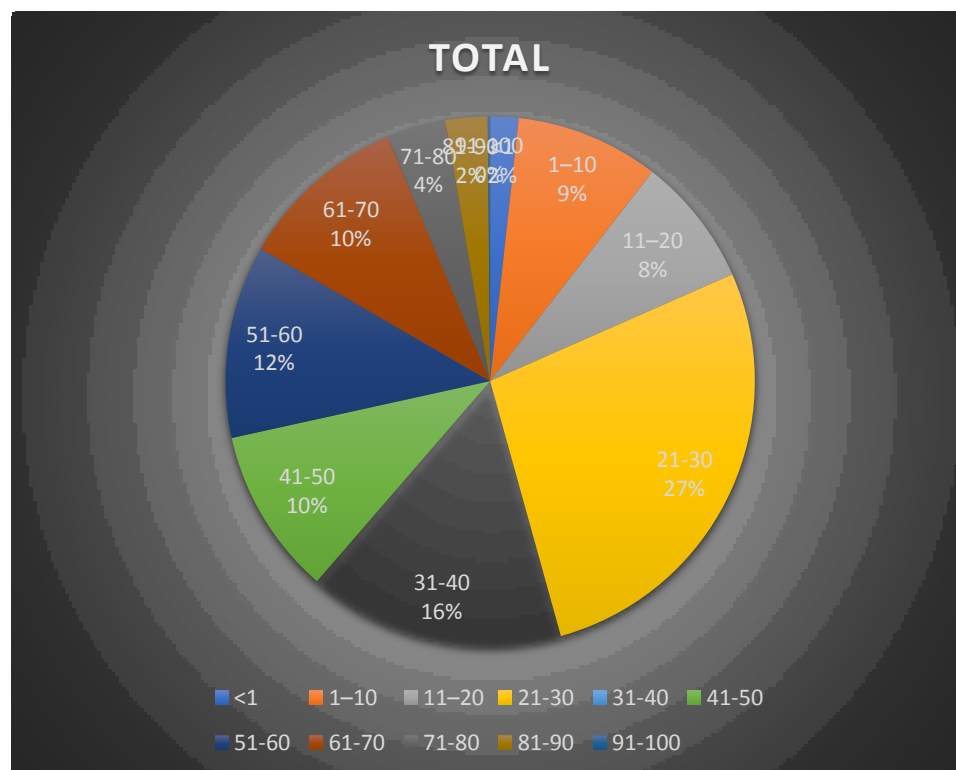


AGE-WISE DISTRIBUTION

This study reported infections in all age groups. The percentage greatly varied among the age group revealing a mixed pattern of infection among all age groups. A minimum percentage of only 2 was reported for age below 1 year. As the age increased infection percentage gradually increased resulting in a maximum percentage of 27 among 21 to 30 years of age (Table 3). This pattern reveals the infection percentage is low in the younger population and less in aged populations. The mid age group are prone to higher infection of *Klebsiella pneumoniae*. post COVID 19 infections (Rosenbaum, 2020). .

Table 3- Age-Wise Distribution

S.NO	PARTICULARS (Years)	TOTAL	PERCENTAGE
1	<1	12	2%
2	1-10	61	9%
3	11-20	55	8%
4	21-30	190	27%
5	31-40	109	16%
6	41-50	71	10%
7	51-60	82	12%
6	61-70	72	10%
7	71-80	25	4%
8	81-90	18	3%
9	91-100	1	0%
	TOTAL	696	



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