



Epidemiology of Communicable Diseases in a Tertiary Care Rural Hospital in Konkan Region of Maharashtra: An Instrument for the Effective Health Planning

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ABSTRACT

Background: Although there has been significant economic progress and development globally over the past few decades, countries in the South-East Asia region continue to face a substantial burden of infectious diseases. In contrast to other low- and middle-income nations, where non-communicable diseases (NCDs) are replacing infectious diseases, India is seeing a situation where infectious diseases persist alongside the growth of non-communicable diseases. This dual burden places additional strain on households in the country.

Methods: A record-based cross-sectional study was conducted in a tertiary care hospital in, the Konkan region. A complete enumeration of one-year data of all critically ill indoor patients was collected from HMIS software and the IDSP Portal and compiled in Microsoft Excel.

Results: Of 957 admitted patients, 61% were males and 39% were females. Around 36% of patients admitted in the most productive age group (15-45 years). The peak in admission was seen in the monsoon season (July to October). Maximum patients were of respiratory illness followed by bacterial cellulitis.

Conclusion: The study will help to formulate policies to control infectious diseases based on their variability according to age, gender, and season.

Understanding the prevalence of diseases will also aid health officials in efficiently allocating resources and implementing preventative initiatives.

Key-words: Communicable diseases, Non-communicable diseases, Season, Cellulitis, Morbidity

INTRODUCTION

A communicable disease results from certain infectious agents or their harmful byproducts that can be transmitted directly or indirectly from one person or

animal to another or from the environment (such as through air, dust, soil, water, food, etc) to a person or animal. Although there has been significant economic progress and development globally over the past few decades, countries in the South-East Asia region continue to face a substantial burden of infectious diseases. In contrast to other low- and middle-income nations, where non-communicable diseases (NCDs) are replacing infectious diseases, India is seeing a coexistence of infectious diseases and the growth of non-communicable diseases.

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This situation places a greater burden on households in the country.^[1,2] Several infectious diseases have been effectively managed and eliminated from the community. Nevertheless, certain illnesses such as dengue, malaria, typhoid, and tuberculosis continue to have a significant effect on both sickness rates and death rates. The international community's unfortunate complacency has resulted from the optimism of a few years ago, which believed that controlling many of these diseases would be easily achievable. The current state of complacency is resulting in the loss of millions of lives.^[3-6]

During the years 2019 and 2020, before the outbreak of COVID-19, diseases that may be transmitted from person to person, such as diarrhoea, tuberculosis, and lower respiratory infections, ranked among India's five leading causes of death. In 2021, lower respiratory infections became the second most fatal infectious disease globally after COVID-19. It was classified as the fifth highest cause of death.^[7,8] The results from various research indicate that the prevalence of NCDs has risen from 37.9% to 61.8% over three decades in the country. In contrast, the prevalence of communicable and infectious diseases has remained at 27.5% during the same time frame.^[2]

Infectious illnesses have evolved from being solely a health concern to social issues that have significant implications for individual well-being and the global community.^[6] India is a country with varied geography, social structures, religious beliefs, seasonal patterns, and economic systems despite its genetic similarity. As a result, the incidence of infectious illnesses continues to vary greatly throughout the country's many geographic areas.^[9]

The coastal and hilly terrain geography and humid and heavy monsoon rain climate of the Konkan region significantly influence the occurrence and distribution of infectious diseases. A comprehensive analysis of morbidity patterns and seasonal variation of diseases in this region will provide an efficient tool for health planners to formulate policies. So, this study was done to find the morbidity patterns of infectious diseases among patients treated at the rural tertiary care hospital and to find its distribution according to age, gender, and season.

MATERIALS AND METHODS

Study design- Record-based observational cross-sectional study.

Study setting- A tertiary care hospital in the Konkan region of Maharashtra.

Methodology- A record-based cross-sectional study was conducted in a tertiary care hospital in the Konkan region after obtaining permission from concerned authorities. A complete enumeration of data of all critically ill indoor patients from August 2023 to July 2024 was collected from HMIS software and the IDSP Portal of this hospital. A universal sampling method was used to enrol infectious disease patients. Data was entered in Microsoft Excel. Variables considered are age, gender, ward, hospital stay, and the types of diagnosed infectious diseases.

Inclusion criteria- Critically ill patients of infectious diseases admitted from August 2023 to July 2024

Exclusion criteria- Paediatric patients (0-15 years) were excluded from the study. Cases with incomplete records were excluded.

Statistical analysis- Related frequency and percentage were drawn for independent variables, and trend analysis was carried out to understand the trends of the diseases. Association between dependent and independent variables with the help of a chi-square test was carried out, and the significance level was established at $p < 0.05$.

Ethical Approval- The above study was approved by the Institutional Ethical Committee of the BKL Walawalkar Rural Medical College, Ratnagiri.

RESULTS

Nine hundred fifty-seven critically ill patients of infectious diseases were admitted from August 2023 to July 2024. Fig. 1 shows that out of 957 sick critically admitted patients for infectious and parasitic diseases, 582 (60.82%) were males and 375 (39.18%) were females.

Fig. 2 illustrates that maximum i.e. 281 (29.36%) admitted patients belong to the 45–60-year age group, followed by 243 (25.39%) of 61–75 years of age, 195 (20.38%) of 31–45 years, 145 (15.15%) 15-to-30-year age group and 93 (9.72%) from above 75 years age group. The mean age for patients admitted for infectious diseases was 51.45 ± 12.49 years.

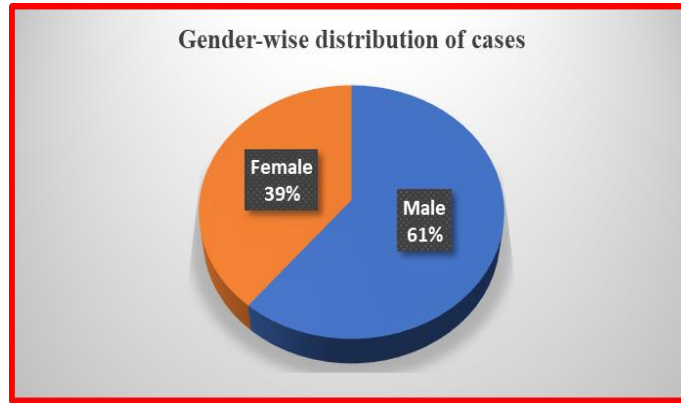


Fig. 1: Gender-wise distribution of cases

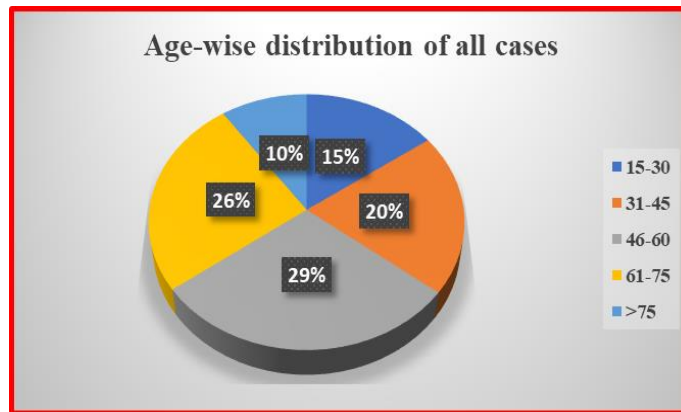


Fig. 2: Age-wise distribution of cases

Fig. 3 illustrates that seasonal trend analysis shows more cases from May to October. Maximum admissions were noted in July, August and September, whereas minimum was reported in November and March. The rainy season in the Konkan region starts in May and continues till

October. Heavy rain and flood situations occur from July to September. A peak in the cases can be seen in July month. An apparent dip in admissions can be observed in the winter and summer seasons (November to April) (Fig. 4).

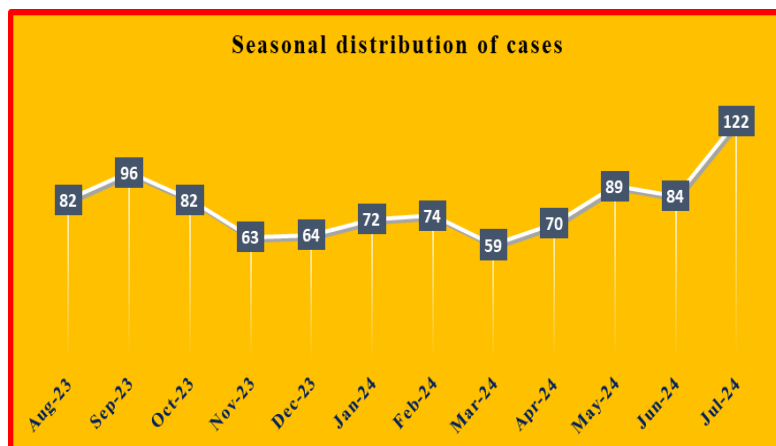


Fig. 3: Seasonal trend of communicable diseases

Table 1 depicts that out of 957 admitted patients, maximum patients 366 (38.24%) were admitted for lower respiratory tract infection, including pneumonia, followed by cellulitis 202 (21.10%), dengue 158 (16.51%), TB 132 (13.79%) and typhoid 63 (6.58%).

Other cases were malaria, H1N1, leptospirosis, and COVID-19. In our study, overall morbid conditions were seen more commonly in males and the difference was statistically significant ($p < 0.005$).

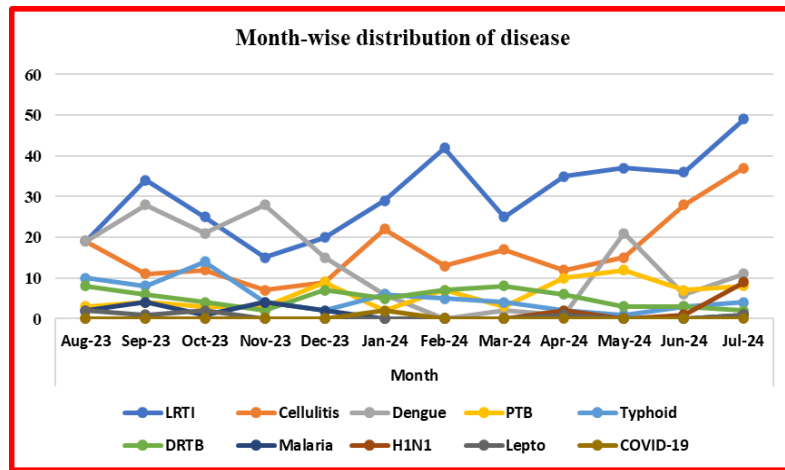


Fig. 4: Month-wise distribution of diseases

Table 1: Distribution of communicable diseases in admitted patients

Communicable diseases	Males (%)	Females (%)	Total (%)
Lower respiratory tract infections (including pneumonia)	215 (58.74)	151 (41.26)	366 (38.24)
Bacterial cellulitis	134 (66.33)	68 (33.66)	202 (21.10)
Dengue	108 (68.35)	50 (31.65)	158 (16.51)
Pulmonary TB	37 (52.11)	34 (47.88)	71 (7.42)
Typhoid	35 (55.56)	28 (44.44)	63 (6.58)
DRTB	32 (52.46)	29 (47.54)	61 (6.37)
Malaria	10 (66.67)	05 (33.33)	15 (1.57)
H1N1	06 (50.00)	06 (55.00)	12 (1.25)
Leptospirosis	05 (71.43)	02 (28.57)	07 (0.7)
COVID-19	00	02 (100)	02 (0.2)
Total	582 (60.82)	375 (39.18)	957

DISCUSSION

Total 957 critically ill patients of communicable diseases were admitted from August 2023 to July 2024. In the present study, out of the total admitted patients, 61% were males. This is significantly higher than for females, and almost all diseases except H1N and COVID-19 are common in males. Kalyani *et al.* [10] found equal distribution among both genders, while Gaikwad *et al.* [11] observed a preponderance of hepatitis, typhoid, malaria and meningitis in males. In contrast, in females, acute diarrhoeal diseases, dengue fever and swine flu were more commonly reported. Goel *et al.* [12] found 61% of cases among males. Datta *et al.* [13], who conducted a study in Tripura to assess the morbidity profile of communicable diseases found an equal proportion of cases among both genders. However, among all cases, Dhoble *et al.* [1] 62% of female patients.

In the present study, almost 36% of patients were in the 15-45 years age group, followed by 29% in the 46–60-year age group. Thus, communicable diseases affect the most productive age group. Kalyani *et al.* [10] found that the majority of patients in the 19-59 years age group (32.78%), which is similar to our findings. Goel *et al.* [12] (62%) and Dhoble *et al.* [1] (56%) also reported more morbidities among persons above 15 years of age. However, we have not included the paediatric (0-15 years) age group in our study, which limits our findings. In the Konkan region, monsoons remain six months a year, from May until October. In the present study, peak admission was seen during the monsoon season (May to October), whereas a dip was noted during the winter and summer seasons (November to March). Maximum cases were reported from July to September when there was a flood-like situation in the region. A study done by Goel *et al.* [12] reported maximum cases during monsoon (62%)



followed by winter and summer seasons. However, Kalyani *et al.* [10] found a maximum number of cases from September and October. The coastal border, dense forests, hilly areas, and heavy rain make the Konkan region's geography distinct from the rest of Maharashtra. So, the seasonal trend is quite different from other regions. Gaikwad *et al.* [11] revealed an increase in cases from June to September, i.e., during the monsoon season. In our study, respiratory illnesses (TB, LRTI) are more common during winter, while vector-borne diseases (Dengue, Malaria and Leptospirosis) and Bacterial Cellulitis cases are more common during monsoon. The increase in cases observed around May and June is likely the transitional phase between summer and the rainy season. This change in weather makes it challenging for the host to adapt, leading to an increased vulnerability. The other reasons may be conditions favourable for the breeding of the vectors and the survival of the agents of the diseases.

In the present study, two-thirds of cases (38%) were admitted for LRTI, including *Pneumonia* followed by Bacterial Cellulitis (21%) and TB (14%). In vector-borne diseases, Dengue contributed 16%, Malaria 2%, and Leptospirosis 1%. Enteric fever was present in around 7% of patients. The study's striking finding was that one-fifth of critically ill patients had Bacterial Cellulitis. The common bacteria were *Morganella morgan*, *Enterobacter cloacae* complex and *Klebsiella pneumoniae*. The peak of Cellulitis cases was reported in June and July when the region had heavy rain. This needs further investigation and research in this region. Kulkarni *et al.* [9] and Datta *et al.* [13] reported respiratory illness as the most common communicable disease in their study while Kumari *et al.* [14] found ARI and COPD more among males and Worm infestation and UTI more among females. Kalyani *et al.* [10] reported enteric fevers in 9.83%, dengue in 10.4%, and malaria in 8.12% of cases, comparable to our findings.

CONCLUSIONS

Based on the findings, it was concluded that Respiratory illness and Bacterial cellulitis were the most common morbid conditions in hospitalized patients. The peak of admission was noted in the monsoon season, whereas a dip occurred during the winter season. Similarly, the overall morbid condition was seen most commonly in

males and the productive age group (15-60 years) bears the maximum burden of communicable diseases.

Several diseases exhibit seasonal fluctuations, and implementing surveillance programs in this region of Konkan to monitor and identify changes in disease trends could help alleviate their impact. Understanding the extent of the disease's impact will also aid health officials in efficiently allocating resources and implementing preventive measures.

LIMITATIONS

- ❖ The results of this study are based on the secondary data available from the hospital.
- ❖ The study included only the critically ill patients and not all admitted patients.
- ❖ The study excluded paediatric (0-15 years) patients, which could have affected the results.

CONTRIBUTION OF AUTHORS

Research concept- Suvarna Patil, Avinash Borkar, Namita Deshmukh, Amey Paranjape

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