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Frequency of Most Prevalent Infectious Diseases Observed in Patients Hospitalized in Larkana, Sindh, Pakistan

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Abstract

All around the world, infectious agents are a major reason for health problems and increased deaths. Having this knowledge, infectious diseases and their risk factors among the hospital visited patients in Larkana were investigated. Between May 2023 and April 2024, data were collected from 840 individuals using the immune chromatographic technique who visited four clinical laboratories in Larkana. We found out both how frequent and how common each infection/disease is. The study was conducted with the review of the institutional ethical committee behind it. Five of the most vital infectious agents/ diseases were chosen for the Top 5 list. Of the patients tested, 385 (45.83%) had Hepatitis B virus infection, 168 (20%) tested positive for Salmonella typhi (associated with Typhoid fever), 128 (15.23%) for Hepatitis C virus, 103 (12.26%) had Helicobacter pylori and 56 (6.66%) for Plasmodium (associated with malaria). More than half of the 840 patients examined for infectious diseases were male at 443 (52.73%) and 397 (47.26%) were female. Most cases were seen in the group aged 21 to 30 and in married patients (52.19%). The study helps estimate the spread of the most frequent diseases, assess the risk factors and manage these diseases in Pakistan.

Keywords*:* Infectious agents, Prevalence, Epidemiology, Larkana

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INTRODUCTION

Microbiology is concerned with scientifically understanding bacteria, fungi, viruses and parasites. A great number of microscopic living things are found near us and they can infect humans and cause different diseases. The reason for raised morbidity and mortality in people across the world is largely due to infectious diseases. GBDS found that infectious disease caused 22% of all deaths and 27% of all disabilities in 2000. Bacterial, viral, fungal and parasitic protozoan diseases are different types of infectious diseases (Schlossberg & Samuel, 2017).

Bacteria are responsible for typhoid fever, cholera, tuberculosis and other typical human diseases. Of the many species of bacteria that lead to diseases in people, *Helicobacter pylori*, *Salmonella typhi*, *Streptococcus pneumonia*, *Mycobacterium tuberculosis*, *Vibrio cholera*, *Brucella abortus* and *Clostridium tetani* are especially important. Among the agents of disease in humans are *Trypanosomes* (leading to sleeping sickness or Chagas' disease), *Leishmania* (linked to Kala-azar and oriental sore), *Giardia* and *Trichomonas*. The agents that may cause these diseases are *Plasmodium* (malaria), *Toxoplasma* and *Cryptosporidium*. Humans can also be sickened by *Entamoeba* (amoebiasis), *Naegleria* (amoebic meningoencephalitis) and *Acanthamoeba* (amoebic encephalitis and keratitis of the cornea) (Patoli, Patoli, & Mehraj, 2010).

Because Pakistan is in the sub-tropics, tropical and subtropical diseases frequently affect it, piling on a heavy burden of infectious disease every year. In addition, factors favoring diseases in Pakistan like poverty, poor hygiene, countless places at risk for more mosquitoes, limited access to food and people not getting (or avoiding) vaccines. Moreover, it means that cholera occurs when poverty and poor personal hygiene are present. All the same, since the state is at risk for infectious illnesses, it does not yet have a reliable surveillance system that handles ID (Naeem et al., 2022; Preim & Lawonn, 2020). As a result, it discusses how both private and public health care have not done enough to manage the spread of IDs. Apart from carelessness, unclear guidelines being ignored, limited healthcare staff lacking training for emerging outbreaks like COVID-19, make it worse for

controlling outbreaks in the country(Preim & Lawonn, 2020).

Co-infection is the leading cause why diseases and infections are more common in developing countries. Those who are poorest tend to suffer the greatest from infectious diseases. A lack of resources for integration and prevention is most severe among these people tools intended for medical use and medications. WHO has listed Pakistan as eighth among the top 22 countries carrying the highest burdens of TB. In 2007, researchers suggest that about 297,108 people in Pakistan (the majority being in their productive years) were diagnosed with TB. Additionally, TB infections and HIV coinfections, together with MDR TB, are becoming worrying trends. Baluchistan became a pilot site in Pakistan when DOTS, an internationally recommended way to control TB, was put into use by the Ministry of Health in 1995. There have been a lot of improvements over the past five years. From 13 percent in 2002, Pakistan's ability to identify cases reached 67 percent by 2007, very near to WHO's target of 70 percent. Based on findings, the proportion of DOTS coverage went up in Pakistan from 44 percent to 99 percent in the years 2002 to 2007. The large jump in detected TB cases reported annually since 2000 is due to both countrywide efforts to include private doctors and community volunteers in the search, as well as to the active support of the public. Since 2001, when the Government made TB a national emergency, efforts have advanced with the help of USAID and the Global Fund to Fight AIDS, Tuberculosis and Malaria (Naeem et al., 2022).

Hence, this investigation aims to highlight how often the most common infectious diseases occur in patients from Larkana and the factors linked to these infections. Such investigations support the prediction of most common diseases, the assessment of risks and efforts to keep such diseases in check in Pakistan.

MATERIAL & METHODS

Data collection and experimental design

From hospitalized people who tested positive for infectious agents, we collected data about the prevalence of infections from the four main laboratories in Larkana. The data were obtained only after obtaining required approvals from the authorities for infected patients during the year of May 2023 to April 2024. Cases of 753 infected patients were followed and written down. Diagnosis of the infectious diseases was accomplished using immune chromatographic techniques (ICT). After that, find out the infection agents'/diseases frequency and percentage.

Ethical Statement

The research was approved by the ethics committee of GC University of Sindh in Pakistan.

Analysis of data

Overall rates of infectious diseases, the amount of infections by gender, patterns by month, connexions to patient marital status and age and infection/disease rates by gender and age were assessed. The data was analyzed using SPSS software version 23. In the current study, calculations were made for both the total number and the percentage of each infectious agent/ disease. The data was displayed and grouped in tables and graphs.

RESULTS

To find the important epidemiological infectious diseases, the hospital looked at frequencies of infected patients in District Larkana from May 2023 to April 2024, tracing 840 cases. From the results it emerged that 385 cases (45.83%) were Hepatitis B virus infected, 168 cases (20%) had Salmonella typhi (causing Typhoid fever) infection, 128 individuals (15.23%) were infected with Hepatitis C virus, 103 were infected with Helicobacter pylori (H. pylori) and 56 cases (6.66%) had Plasmodium (the parasite that causes malaria) infection (Figure 1).

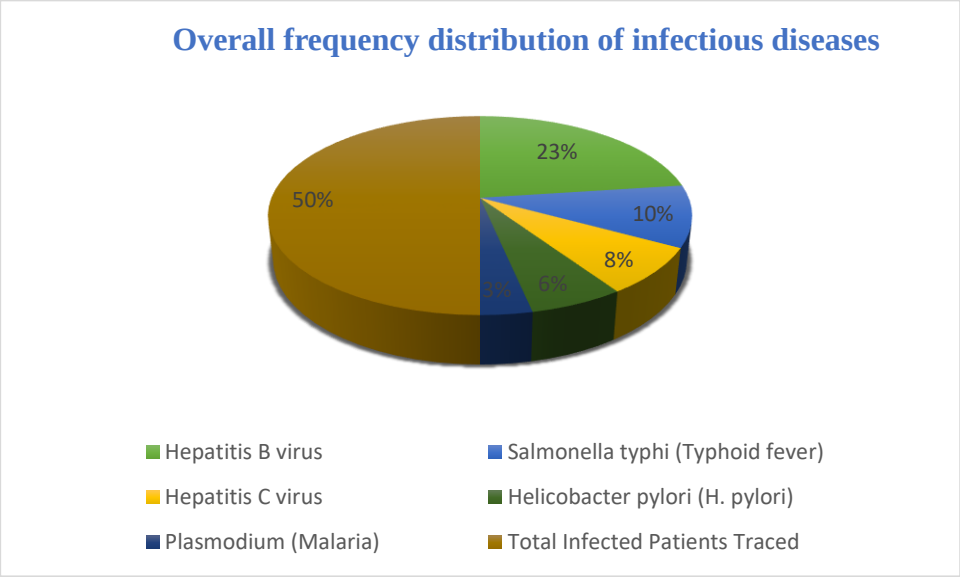

Figure 1: Overall Frequency distribution of Infectious diseases

Gender wise infectious diseases

Of the patients assessed for infectious diseases, 443 were male and 397 were female. All in all, male and female cases were very like at risk for infections (Figure 2). Out of 105 patients with H. pylori, 52 were female (49.52%) and 105 were male (52.38%). We saw that 49.14% of the 175 cases of Typhoid fever were female, while 52% were male. In 364 Hepatitis B cases, 194 (53.29%) were males and 184 (50.54%) were females. From all the 140 cases of Hepatitis C, there were 69 males (49.28%) and 59 females (42.14%). There were 26 males (46.42%) and 24 females (42.85%) among the 56 people infected with Malaria (Figure 2).

Overall Gender Distribution (Total Patients: 840)

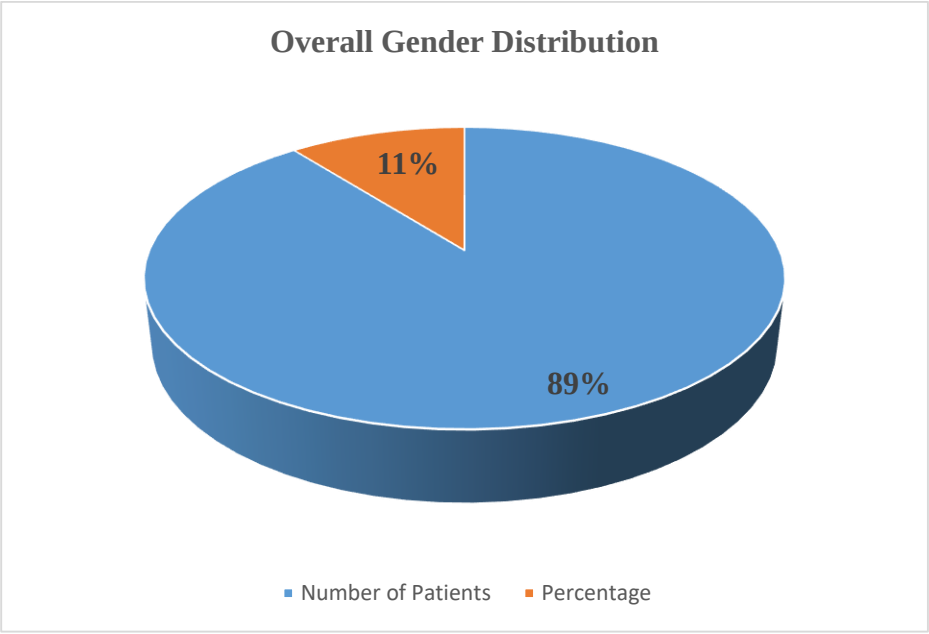

Figure 2: Overall Gender Distribution (Total Patients: 840)

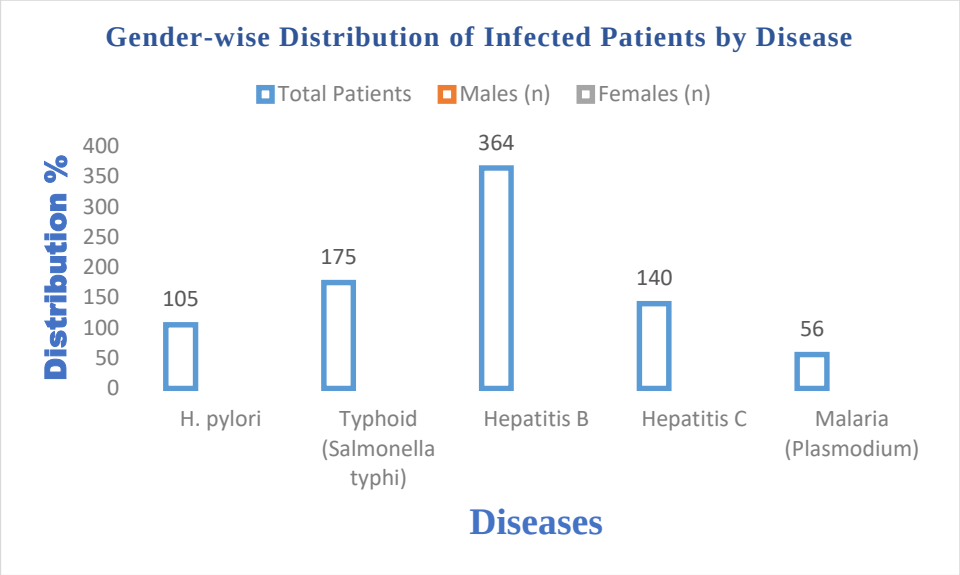

Figure 3: Gender Distribution of infected patients by disease

Table-1: Age-wise frequency of infections/ diseases

Age Group	H. pylori		Typhoid fever		Hepatitis B		Hepatitis C		Malaria	
	Count	%	Count	%	Count	%	Count	%	Count	%
10 to 20	6	5.7%	59	33.71 %	72	19.78	58	38.57%	14	25 %
21 to 30	54	51.42 %	70	40 %	190	52.19 %	13	9. 28 %	14	25 %
31 to 40	18	17.14 %	18	10.28 %	47	12.91 %	22	15.71 %	10	17.85 %
41 to 50	13	12.38 %	12	6.85 %	23	6.31 %	28	20 %	9	16.07 %
51 to 60	9	8.57 %	10	5.71 %	14	3.84 %	11	7.85 %	7	12.5 %
61 to 70	5	4.76 %	4	2.28 %	18	4.94 %	8	5.71 %	2	3.5 %
Total	105	100%	175	100%	364	100%	140	100%	56	100 %

Age-wise infectious diseases

The largest number of infectious diseases were found in people aged 21 to 30 (see Table 1). Among the studied age groups, the highest rate (52.19%) was found in those between 21 and 30 years and the next highest (19.78%) was among those between 10 and 20 years. Alaska Natives between 31 and 40 years old received 12.91% of Hepatitis B tests; those aged 41 to 50 years had 6.31% of the cases; those aged 51 to 60 saw 3.84% of the cases and 61 to 70 years had only 4.94%. Forty percent of people diagnosed with Typhoid fever were 21-30 years old and 33.71% were 10-20 years old. For the years 2015 to 2019, those age 51-60 had the next highest rate of Typhoid fever at 5.7%, followed by 31-40 years at 10.28%, then 41-50 years at 6.85%. The 61-70 age group shows the smallest number of cases with a rate of 2.28%. Among all patients tested, those in the age range of 10-20 years were found to have Hepatitis C at the highest rate (38.57%), after which the rate reduced in those ages 41-50 (20%). Hepatitis C infections in adults are highest among 31 to 40-year-olds (15.71%), followed by 51 to 60-year-olds (7.85%), then 21 to 30-year olds (9.28%). H. pylori was present in most cases (49.52%) in adults aged 21 to 30, with the next highest number found in the 31 to 40 age group (17.14%). The lowest H. pylori infection is seen in the age group of 10-20 (5.7%), followed by 61-70 (4.76%), 41-50 (12.38%) and 51-60 (8.57%) years. In both the 10-20 age group (25%) and the 21-30 age group (25%), Malaria was common. For other age groups, Malaria was found in: 41-50 years (16.07%), 31-40 years (17.85%), 51-60 years (12.5%) and 61-70 years (3.5%) showed the lowest rate (Table 1).

DISCUSSION

Many lives are lost every year in the developing countries, including Pakistan, due to microbial infections6. Thus, active efforts are needed to check the worldwide increase in death rates, paying special attention to emerging countries, to protect them from

these diseases. Laboratory data was gathered from several hospitals in Larkana to check for infectious diseases and obtain epidemiological results. Here, we present information on the transmission of infectious diseases, the related risks, their prevention and control in Pakistan among the selected population. New researchers can later compare their observations with our findings and data which will help them better understand infectious diseases in Larkana.

A new scientific view suggests that factors including gender, age and location can shape how patients respond to antibiotics and any medicine that treats infections. For this study, researchers emphasized five diseases that significantly affect the economy (Hepatitis B, Typhoid fever, Hepatitis C, H. pylori and Malaria). Yet, the Hepatitis B rate was much greater than expected in the area and population under study (52.19%). In all these studies, far more individuals had viral diseases (HBV and HCV) than all other diseases.

Both infection response and use of therapy are closely associated with gender, age and geographic location. Five important diseases (Typhoid, Helicobacter pylori, Malaria, Hepatitis C, Hepatitis B) are examined in this study. Typhoid fever accounted for 59.78% of the infectious diseases identified in the selected population, compared to 22.24% among all the people treated for any diseases in the study (Naeem et al., 2022). According to Sharma and Malakar in 2012, typhoid saw around 26% of total visits; this compares well to the recent rates seen in Buner District. The region studied found that the rate of H. pylori were (31.74%). The H. pylori rate in the center and north of Pakistan was estimated to be between 66% and 84%. As a result, there was less H. pylori infection reported. In the current study, malarial infection occurred in 3.7% of cases. yet, the occurrence of viral infections was not very frequent in the individuals studied in that area. Hepatitis C and Hepatitis B occurred in (3.17% and 1.58%) of the cases being analyzed (Naeem et al., 2022).

What we observe here is not in line with what was previously reported which mentioned that HBV and HCV were the country's top two economically important viral diseases. The current discovery that Typhoid fever affects a large proportion (21.5%) is greater than the rates in earlier studies (Ullah et al., 2020). which found 10%. H. pylori was less common in the researched population than it is in many other large Pakistani cities. About 66% to 84% of people in the Pakistan northern and central areas had H. pylori. Around 80% of people in Karachi are thought to be infected with H. pylori (Khan, Akbar, & Shah, 2022).

CONCLUSION

The research demonstrates that students' physical health is determined by how hygienic they are. They should guide the students to practice important habits related to healthy lifestyle, including clean hands before eating, avoid eating unclean food and eat well-made meals. Teachers are encouraged to persuade children to select fresh vegetables, have milk regularly and add dietary fibers to their meals when the doctor recommends it. Exams should be done regularly, as this will catch diseases such as abdominal pain, diarrhea, constipation, nausea, rash and stomach pain. Every now and then, the School Medical Officer may check a student's physical health and hygiene to detect infections early and prevent them from being complicated.

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Competing Interests: None of the authors have factors that could affect their results.

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