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Original Research Article

A Study on Epidemic Diseases in Multispecialty Health Care System

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Abstract:

Aim: to evaluate, over a certain time period, the prevalence and distribution of epidemic diseases among patients admitted to District Hospital Rajahmundry.

Methodology: Over the course of six months, Prospective observational method was used to conduct a study on the prevalence of a certain disease and its co-morbidities. There are multiple diseases with different clinical spectrums, and among them, different risk factors may likely be helped out. This is a prospective epidemiological study carried out at the 500-bed super specialty government hospital known as the Tertiary Care Teaching Hospital. The six-month study period from November 2023 to April 2024 was dedicated to assessing the cases for epidemically. From the patient's case survey, demographic and diagnostic information for patients below 20 years to above 81 years gathered and divided into 8 different groups.

Objectives: To find out how often epidemic diseases are overall among patients who are admitted to Rajahmundry District Hospital. List the specific epidemic diseases that hospital patients are most frequently diagnosed with. Examine the seasonal differences in the prevalence of diseases that are spreading.

Results: The illnesses with the highest prevalence were Dengue, Malaria, Influenza, HIV/AIDS, and renal Severe Acute Respiratory Syndrome (SARS), respectively.

Conclusion: The most prevalent disease Dengue (44.1%), Malaria (24.2%), Seasonal Influenza (13.4%), HIV/AIDS (9.9%), SARS (8%) respectively. The most prevalent age group of common epidemic diseases is 41-50 years (31.9%) 31-40 years (17.9%).

Keywords: Epidemic Diseases, Prevalence, Malaria, Dengue, SARS, COPD.

Introduction

Due to its distinct topography and climate, Rajahmundry, a historically significant city in the Indian state of Andhra Pradesh, has maintained a leading position in the field of public health surveillance. One noteworthy example is the District Hospital Rajahmundry, which is a vital component of the region's primary healthcare system.

This prestigious medical centre has been essential in identifying and treating epidemic diseases that affect the community. The hospital has been actively involved in managing the common epidemic diseases that have a foothold in Rajahmundry and its neighbouring regions because to its unshakable commitment and dedication. In this extensive piece, we examine the common epidemic illnesses that present a serious health risk. Threat in Rajahmundry, providing information on the prevalence of these illnesses, their effects on the local population, and the preventive steps the District Hospital has done to lessen their impact and spread.

Common Epidemic Diseases in district hospital Rajahmundry: The extremely contagious virus that causes influenza, also referred to as the flu, predominantly affects the respiratory system, causing a spectrum of symptoms from mild discomfort to severe respiratory distress. High levels of hospitalization and outpatient visits demonstrated a clinical influenza-associated burden on patients and healthcare systems, which is exacerbated by co morbidities. Greater investigation into indirect costs and prolonged absenteeism associated with influenza infection is required to fully understand the economic burden in this population [1]. Throughout history, influenza has had a profound effect on civilization due to a number of pandemics that have caused widespread disease and even fatalities. The 1918 Spanish Flu was one of the worst influenza outbreaks ever documented. It claimed millions of

lives globally and demonstrated how quickly the virus could spread and evolve, providing a continuous threat to public health. The advent of pandemics caused by influenza serves as a reminder of the value of immunization and preventative public health efforts in limiting the transmission of infectious diseases and their overall negative effects on populations. Comprehending the features of influenza, such as its seasonality and transmission dynamics, is crucial for devising efficacious approaches for prevention, early detection, and response measures. In order to avert future pandemics and safeguard public health, the international community stays watchful in monitoring and responding to the constantly changing nature of influenza viruses as research and surveillance continue to progress.

Several factors are associated with the increasing risk of spread of the dengue epidemic: the changing distribution of the vectors, especially in previously dengue naïve countries; the consequences of El Nino phenomena in 2023 and climate change leading to increasing temperatures and high rainfall and humidity; fragile health systems in the midst of the COVID-19 pandemic [2]. Local healthcare providers have observed a significant increase in dengue fever cases in Rajahmundry, a viral ailment caused by Aedes mosquitoes. The virus's tendency to spread in urban environments with poor sanitation and inefficient water storage methods is the cause of this increase in instances. There has been a noticeable increase in dengue cases at the local hospital, particularly following the rainy season, with hundreds of confirmed cases reported year. This pattern emphasizes how urgently comprehensive public health initiatives are needed to stop dengue fever from spreading and lessen its negative effects on the population.

Several factors are associated with the increasing risk of spread of the dengue epidemic: the changing distribution of the vectors especially in previously dengue naïve countries; the consequences of El Nino phenomena in 2023 and climate change leading to increasing temperatures and high rainfall and humidity; fragile health systems in the midst of the COVID-19 pandemic [3]. Another viral disease spread by mosquitoes, chikungunya, sometimes presents with symptoms similar to dengue, making diagnosis a significant difficulty.

The reason behind the high incidence of this illness is because the vectors that spread it flourish in environments that are similar to those that encourage the growth of mosquitoes that transmit dengue. According to the hospital's detailed records, there have been repeated chikungunya epidemics; these outbreaks typically coincide with periods of increased dengue incidence. Such simultaneous outbreaks complicate public health interventions because they call for a multimodal strategy to adequately address the community's growing health concerns. Understanding the pathway from infections with V. cholerae to confirm and reported clinical cholera is crucial for interpreting passive clinical surveillance data and serosurveys, making inferences about transmission dynamics and disease burden and ultimately improving our ability to target resources in the fight against cholera [4]. The bacterium Vibrio cholerae is the cause of cholera, a severe diarrheal sickness that is extremely contagious. This infectious condition can cause severe dehydration in a short amount of time, which makes it a serious hazard. Cholera is a serious public health issue that is mostly spread throughout the world by the ingestion of contaminated food or water. Devastating cholera outbreaks have struck many parts of the world throughout history, underscoring the critical need for preventative measures and good sanitation practices to reduce the disease's spread and population-damaging effects.

Since its discovery in the early 1980s, HIV/AIDS - short for acquired immunodeficiency syndrome and human immunodeficiency virus, respectively—has been acknowledged as a serious worldwide health concern. The main ways that the virus spreads are through unprotected sexual contact, intravenous drug use, and mother-to-child transmission during childbirth or nursing [5]. HIV targets CD4 cells in particular to damage the immune system and impair the body's resistance to infections and illnesses. If neglected, this chronic illness can evolve into AIDS, a more advanced stage of the disease marked by significant immune system damage and the emergence of opportunistic infections. A lot of work has been done over the years to improve access to testing and treatment, dispel the stigma attached to HIV/AIDS, and increase public understanding of the disease. HIV/AIDS continues to be a major worldwide public health problem despite advances in medical technology and treatment choices. This underscores the continued need for preventive initiatives, education, and support for those living with the infection. The Ebola virus illness is a highly contagious and frequently fatal sickness that is caused by the Ebola virus. It is considered a serious public health emergency because it spreads quickly through direct contact with infected body fluids. Numerous catastrophic outbreaks caused by this very infectious illness have mostly struck West and Central Africa [6]. The capacity of the Ebola virus to induce multiple organ failure and severe haemorrhagic fever, which raises the death rate among infected individuals, emphasizes the disease's severe character. In order to stop the spread of this deadly virus, the World Health Organization and other medical authorities have repeatedly stressed the significance of stringent infection control procedures, quick diagnosis, and

containment tactics [6]. Furthermore, the stigma and fear surrounding Ebola outbreaks have made public health issues worse in impacted areas and highlighted the vital need for comprehensive education and communication to debunk falsehoods and misconceptions about the illness. As long as Ebola outbreaks continue to represent a serious threat to people globally, the development of viable vaccinations and therapies for the disease must come quickly. This is a critical priority for global health programs. To prevent future epidemics and protect public health globally, it is imperative to enhance healthcare response skills and infrastructure in areas susceptible to Ebola outbreaks.

The SARS-associated corona virus (SARS-CoV) is the cause of the viral respiratory disease known as SARS, or severe acute respiratory syndrome. When this particular corona virus strain originally appeared in 2002, it caused a major global outbreak that rocked several countries until health officials and experts from all around the world worked together to effectively manage it [7]. The advent of SARS signalled a turning point in the history of epidemiology, requiring immediate action and strict controls to stop the disease's spread. Serious respiratory symptoms, such as fever, coughing, and difficulty breathing, were displayed by the infected persons, raising worries about the virus's potential to wreak widespread destruction if it is not stopped quickly.

The fast pace of SARS spread highlighted the significance of a strong public health system and cooperative methods for efficiently handling infectious illnesses worldwide [7]. In order to monitor and isolate any cases, the containment efforts included travel restrictions, quarantine restrictions, and increased surveillance. This served as an example of the significance of early discovery and strong control measures in the fight against new infectious dangers. The concentrated focus on SARS research and containment tactics made it possible to enhance response systems and readiness for future viral epidemics, highlighting the vital necessity of ongoing cooperation and vigilance in order to protect public health globally.

However, given the emergence of 2019-nCoV [15]. The measles virus causes the viral infection known as measles, which manifests as a high fever, rash, cough, runny nose, and red eyes [8]. Particularly in young children or individuals over 20, this illness can result in life-threatening complications such as pneumonia, encephalitis, and in rare instances, even death. When an infected individual coughs or sneezes, respiratory droplets are released, which quickly disseminate the extremely infectious measles virus. The measles vaccine is efficient in avoiding the disease, yet pockets of unvaccinated people and low vaccination rates continue to cause outbreaks across the world. Vulnerable groups are put at risk when the virus resurfaces and spreads within communities due to these gaps in vaccine coverage. To contain and ultimately eradicate measles outbreaks, public health initiatives must prioritize immunization campaigns, expanding access to healthcare facilities, and refuting false information on vaccines. To achieve herd immunity and stop the spread of the measles virus, prompt vaccination efforts, increased public awareness, and community involvement are essential for protecting individuals and averting further outbreaks.

Yesinia pestis is the bacteria responsible for the plague, an infectious disease that is very contagious and fatal. Due to this bacterium's fast spread, it has caused several devastating epidemics that have had a long-lasting effect on human history [9]. The most well-known of these outbreaks was the European epidemic known as the Black Death in the fourteenth century, which claimed an unparalleled number of lives and caused immense misery.

The Black Death devastated communities and created a generalized terror that changed cultures. It was typified by symptoms including fever, chills, and the development of painful buboes. Millions of individuals are said to have died from this incurable illness, which left a huge social and economic impact in its aftermath. The plague had a devastating effect on medieval society, having long-lasting effects on medicine, religion, and culture. The threat of the plague persists as a reminder of the devastation that infectious illnesses may cause and the necessity of being vigilant in order to stop future outbreaks, even in spite of centuries-long improvements in healthcare and sanitation. The plague's lasting effects serve as a moving reminder of both the frailty of human life and the ability of communities to persevere in the face of hardship.

In tropical places, malaria, a disease transmitted by Anopheles mosquito bites and caused by the Plasmodium parasite, continues to be a serious health risk. Because these are mosquito breeding grounds, places with stagnant water bodies have a noticeably higher prevalence of malaria. This increased risk is most noticeable in the monsoon season when mosquito populations are most likely to flourish [10].

Data collected from the District Hospital indicates a steady rise in the number of cases of malaria reported each year. There's a considerable increase in malaria cases from December to May, with the highest numbers observed throughout this time. This pattern highlights the seasonality of malaria transmission and the importance of vigilance and

proactive measures to curb the spread of the disease during these peak months.

Self-protective behaviours, accelerating information diffusion is able to both inhibit epidemic transmission and raise epidemic threshold. Current findings provide us a better understanding for the prevention and controlling of real infectious disease [11]. The challenges posed by twenty-first century epidemics are real and changing: future epidemics will be fuelled by conflict, poverty, climate change, urbanization and the broader demographic transition [12]. This study is an initial exploration toward understanding disease transmission patterns and a first step towards formulating effective intervention strategies for Greece [17].

Preventive Measures: Vector control involves the destruction of mosquito breeding sites to reduce the population of mosquitoes that act as vectors of disease. Other important measures for the prevention of mosquito-borne diseases include insecticide-treated bed nets, indoor residual spraying, and use of protective clothes.

Personal protection against mosquitoes includes the application of mosquito repellents, screening of windows and doors to prevent the entry of the mosquitoes into living quarters, and caution by avoiding outdoor activities at times when mosquitoes are most active or apt to bite.

Source reduction methods, such as properly disposing of refuse, cleaning the drainage system, and avoiding stagnant water, coupled with covering and cleaning gutters and water storage containers regularly, are major components in mosquito control measures and disease prevention.

The health education activities are very key in creating awareness in the community on how diseases are vector-borne by mosquitoes, their common symptoms, and the need to seek early medical consultation for appropriate treatment. Vaccination programs, wherever relevant, like the dengue vaccine in particular regions, can help add a line of defence against mosquito-borne diseases and help reduce the general burden of these diseases in such areas. Ensure water safety by providing clean sources of water and adopting good water storage practices in one's premises to prevent waterborne diseases that can be a result of the mosquito vector breeding in contaminated water bodies.

Surveillance and early warning systems would allow monitoring of the trends in diseases and the earliest possible detection of outbreaks with an assurance of timely and effective response to reduce mosquito-borne illnesses.

This should be supplemented by health system strengthening through availability of adequate medicines, supplies, and trained human resources for case management and treatment. Case management protocols can be developed and readied for the preparedness of health systems in handling cases of mosquito-borne diseases.

Travel advisories, with information aimed at travellers to take preventive measures in endemic areas, may aid individuals in protecting themselves from mosquito-borne diseases while traveling to places where these diseases are more common. Research and development work should be pursued toward developing new vaccines and drugs against mosquito-borne diseases for effective public health interventions in the area of vector-borne diseases control and prevention.

Aim & Objective:

- Find out how often epidemic diseases are overall among patients who are admitted to Rajahmundry District Hospital.
- List the specific pandemic diseases that hospital patients are most frequently diagnosed with. Examine the seasonal differences in the prevalence of diseases that are spreading.
- Examine the age, gender, occupation, and other demographic details of patients afflicted by epidemic diseases.
- Analyse how well current treatment plans and preventive strategies work to control epidemic diseases.
- Examine any trends or hotspots for epidemic diseases in particular regions that District Hospital Rajahmundry serves.

Make suggestions for improving management, preventive, and surveillance tactics to stop the spread of infectious diseases in the area.

Methodology

Study Design: A prospective observational study.

Study Site: The study was conducted in the General medicine Department in Government Teaching General District Hospital, Rajahmundry, Andhra Pradesh, India.

Study Period: Jan 2023 – June 2024.

Study Population: 523 cases were collected from general medicine and other departments cases in wards according to study criteria.

Inclusion Criteria: In patients Patient of Any age. Patients of either sex. Patients with Co-morbid conditions. Patient with past and personal history.

Exclusion Criteria: Out-Patients, Pregnant and lactating women. The patients who are not willing to give consent.

Data Analysis: Data was analysed on SASS software, MS Excel and descriptive statistics was used for analysing the result of the study.

Over the course of six months, Prospective observational study was used to conduct a study on the prevalence of epidemic disease and its co-morbidities. There are multiple diseases with different clinical spectrums, and among them, different risk factors may likely be helped out. This study carried out at the 680-bed super specialty government hospital known as the Tertiary Care Teaching Hospital. The six-month study period from Jan 2023 to June 2024 was dedicated to assessing the cases for epidemic diseases. From the patient's case survey, demographic and diagnostic information for patients between the ages of 20 and 80 was gathered. A study was done on 523 cases of Dengue, Influenza, Small pox, Yellow pox, Malaria, SARS, HIV/AIDS, Ebola, Measles, Plague, Cholera, Zika virus with co-morbidities, which comprised We performed in-patient (IP) visits on Mondays to Saturday for six months (November 2023- April 2024). During ward visits, we randomly selected patient cases from several specialized areas within the hospital. Patients were evaluated for disease.

This is prospective research designed to hypothesize on the potential of an existing disease in a specific location.

Results & Discussion

Table 1: Percentage of gender having particular diseased condition

Sl. No	Diagnosis	No. of Patients	No. of Male	No. of Female	Total %
01	Dengue	230	131	99	44.1%
02	Malaria	127	71	56	24.2%
03	Influenza	70	39	31	13.4%
04	Ebola	-	-	-	0%
05	SARS	42	24	18	8%
06	HIV/AIDS	52	29	23	9.9%
07	Small pox	01	01	0	0.2%
08	Yellow pox	01	0	01	0.2%
09	Measles	0	0	0	0%
10	Plague	0	0	0	0%
11	Cholera	0	0	0	0%
12	Zika virus	0	0	0	0%
	Total	**523**	**295(56.5%)**	**228(43.6%)**	**100%**

Table 2: Distribution of the patients according to age groups

S.NO	Age group	Gender		No of Total	Total %
		Male	Female		
01	>20	34	25	59	11.28%
02	21-30	26	20	46	08.79%
03	31-40	53	41	94	17.97%
04	41-50	92	75	167	**31.97%**
05	51-60	38	29	67	12.93%
06	61-70	28	20	48	09.17%
07	71-80	23	18	41	07.83%
08	<80	01	00	01	0.19%
	TOTAL	**295 (56.4%)**	**228 (43.6%)**	**523 (100%)**	**100%**

Table 3: Percentage of particular disease with co – morbidity

Sl. No	Morbidity	No. of patients	Co - morbidities	No. of patients	Percentage
01	Chronic Obstructive Pulmonary Disease (COPD)	144	COPD + HTN COPD + DM COPD + HTN + DM COPD + Miscellaneous (excluding HTN and DM)	62 31 48 03	43% 21% 33% 2.08%
02	Chronic Kidney Disease (CKD)	48	CKD + HTN CKD + DM CKD + HTN + DM CKD + Miscellaneous (excluding HTN and DM)	05 27 16 00	10.41% 56.25% 33.33% 00 %

03	Chronic Liver Disease (CLD)	07	CLD + HTN CLD + DM CLD + HTN + DM CLD + Miscellaneous (excluding HTN and DM)	05 01 01 00	71.42% 14.28% 14.28% 00 %
04	Acute Pancreatitis (AP)	11	Acute Pancreatitis + Alcohol Acute Pancreatitis + Smoker Pancreatitis + Alcoholic + Smoker Pancreatitis + Miscellaneous	05 04 02 00	45.45% 36.36% 18.19% 00 %
05	Osteoarthritis (OA)	01	O. A + HTN O. A + DM	01 00	100% 00%
06	Coronary Artery Disease (CAD)	18	CAD + HTN CAD + DM CAD + HTN + DM	01 09 08	5.55% 50 % 44.44%
07	Viral Haemorrhagic Fever (VHF)	58	VHF + HTN VHF + DM VHF + DM +HTN VHF + Miscellaneous	04 07 02 45	6.89% 12.06% 3.44% 77.58%
08	Miscellaneous	02	Other Miscellaneous Diseases	02	100%

Conclusion

The present research on the study of epidemic diseases in a district government hospital brought out very important findings. Dengue was the most prevalent epidemic disease (41.1%), followed by malaria (24.2%), influenza (13.4%), HIV /Aids (9.9%), SARS (8%) respectively. The maximum prevalent age group was found to be 41–50 years (31.9%), 31-40 years (17.97%), 51-60 years (12.6%), which proves that there is a higher vulnerability in middle-aged adults. The most common co morbid condition among patients was chronic obstructive pulmonary disease (49.82%), Viral Haemorrhagic Fever (20.06%), chronic kidney disease (16.60%), coronary artery disease (6.22%), Acute Pancreatitis (3.80%), Chronic Liver Disease (2.42%) respectively. These results therefore point toward the fact that targeted interventions should be directed at enhancing vector control measures for dengue and malaria and making specialized care available to patients with COPD. These trends should guide the design of future public health strategies for this district for managing these diseases and implementing appropriate prevention measures as mentioned above.

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