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Status of Common Communicable Diseases in Children Tested Using ELISA Methods in Wasit Province, Iraq: A Retrospective Study

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A B S T R A C T

Introduction: An infectious or communicable disease (CD) is a condition triggered by an infectious agent or its byproducts that can be transmitted from one individual to another. A critical condition refers to a state of disorder that arises either during or following a regional conflict or a natural disaster, such as a flood or earthquake. Throughout emergency situations, the mortality rate due to infectious diseases can be 60 times higher than other causes, such as trauma. Over 40% of fatalities in emergency situations are caused by diarrhoeal illness, with children under the age of 2 years old accounting for 80% of these fatalities.

Method: The present study was conducted to understand the status of the common communicable diseases in children in Wasit Province, Iraq, during the years; 2018, 2019, and 2020. The study relied on retrospective data collected from the Department of Statistics at the General Teaching Hospital, Al-Kut City, Iraq. The study included thousands of children, who attended the hospital to seek medical attention due to suffering a CD. These subjects were tested using different types of ELISA methods.

Results: The results revealed a significant ($p < 0.05$) high spread of many CDs among children, such as mumps, chickenpox, cutaneous and visceral leishmaniasis, hepatitis B, bacillary dysentery, and cutaneous anthrax. Some other CDs showed significant ($p < 0.05$) lower spread among children, such as acute flaccid paralysis, pertussis, and brucellosis.

Conclusion: The current study indicates important information about the status of the common communicable diseases in children in Wasit Province, Iraq, during the years 2018, 2019, and 2020.

Keywords: Communicable Diseases, Hepatitis B, Rabies

Introduction

During premodern times, the worldwide dissemination of infectious diseases was facilitated by colonisation, slavery, and war, resulting in severe consequences. Prior to the development of vaccines, diseases like tuberculosis, polio, smallpox, and diphtheria were prevalent among humans, resulting in significant illness and death. Over the last twenty years, advancements in medicine, increased availability of healthcare, and improved hygiene have led to a decline in both mortality and morbidity associated with infectious diseases. This is particularly evident in the case of pneumonia and diarrhoea.[1]

The quick expansion of the COVID-19 vaccine demonstrates the effectiveness of modern science in promptly addressing emerging pathogen threats. However, nations with poor incomes continue to face a significant burden of infectious diseases, with high rates of mortality and morbidity related to neglected tropical diseases. Furthermore, fatalities caused by newly appearing and recurring infections have remained a consistent issue in the twenty-first century, when compared to deaths resulting from seasonal and endemic illnesses. This suggests the potential for an age of infectious disease characterised by a rapid expansion of different infectious agents. This is facilitated by travel and changes in pathogen ranges as a result of climate change.[2]

Pathogens of humans can display unique patterns of circulation at the local level. The observed style will be influenced by demographic variables. For instance, the occurrence of school terms contributes to the spread of various childhood infections. Additionally, gender-specific travel patterns may lead to a greater prevalence of chikungunya among women in Bangladesh. Furthermore, immunity plays a significant role in shaping the transmission of immunising infections like measles and rotavirus.[3]

The impact of school attendance on the transmission of childhood infections and human mobility has been widely recognised. Consequently, the significant rise in global school attendance rates has the potential to significantly modify the dynamics of various infections.[4] This phenomenon has been observed in Thailand for dengue and in Costa Rica for rubella, as these countries underwent a demographic transition. On the other hand, it is possible that ageing populations could contribute to an increase in transmission rates.[5]

The dynamics of a population can be influenced by demographic changes resulting from urbanisation, which can impact both the size and density of the population. The context of infectious diseases has been significantly impacted by demographic change in recent years. However, an even more substantial effect can be attributed to alterations in the immune reaction, which in turn have the potential to influence other infections.[1] The burden of tuberculosis has been intensified by the emergence of HIV, as evidenced by various studies.[3,6] The implementation of mass drug administration initiatives has resulted in a decrease in the occurrence of helminth infections. This reduction is expected to have secondary consequences on the prevalence of other diseases, such as malaria, which may be more common in individuals with a high number of worms. Additionally, these factors will also impact the effectiveness of vaccination programs.[4]

The climate is a significant factor in influencing the seasonal patterns of various infectious diseases at the local level. Consequently, global changes in climatic conditions have the potential to modify these dynamics. Numerous respiratory pathogens, such as the influenza virus, demonstrate a more pronounced seasonal pattern in temperate climates while displaying increased persistence throughout the year in tropical regions.[7,8] The phenomenon of climate change is anticipated to result in the amplification of tropical patterns, which could potentially have consequences for the evolution of pathogens.[9,10]

Materials and Methods

The present study was conducted to understand the status of the common communicable diseases in children in Wasit Province, Iraq, during the years; 2018, 2019, and 2020. The study relied on retrospective data collected from the Department of Statistics at the General Teaching Hospital, Al-Kut City, Iraq. The study included thousands of children, who attended the hospital to seek medical attention due to suffering a communicable disease (CD). These subjects were tested using different types of ELISA methods.

Statistical Analysis

GraphPad Prism v9.0 (USA) was used to analyse data. One-way ANOVA test was followed at a probability (p) that was at less than 5%.

Results

The results revealed a significant ($p < 0.05$) high spread of many CDs among children, such as mumps, chickenpox, cutaneous and visceral leishmaniasis, hepatitis B, bacillary dysentery, and cutaneous anthrax. Some other CDs showed significant ($p < 0.05$) lower spread among children, such as acute flaccid paralysis, pertussis, and brucellosis (Table 1).

The diseases showed variable levels during the examined years, such as in the case of acute flaccid paralysis revealed gradual decreases until the end of year 2020. Moreover, bacterial meningitis also showed a decline in the number of children affected until the end of the year 2020. In the case of rabies demonstrated increases in their levels to reach the highest during 2020.

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Table 1.Prevalence of Communicable Diseases in Children of Wasit Province, Iraq

Disease or Condition	Year		
	2018	2019	2020
Acute flaccid paralysis	44	28	4
Pertussis	38	19	11
Measles	0	86	0
Mumps	548	208	57
Tetanus	27	12	8
Chickenpox	1411	578	149
Typhoid fever	2	104	444
Haemorrhagic fever	0	0	1
Leishmaniasis (cut.)	396	236	535
Leishmaniasis (visc.)	21	25	10
Toxoplasmosis	26	32	0
Hydatidosis	6	3	5
Brucellosis	83	86	72
Rabies	0	1	5
Animal bite	1037	966	606
Typhus	0	10	13
Hepatitis B	79	107	41
Meningitis (bacterial)	68	40	0
Leprosy	0	0	251
Bacillary dysentery	57	6	326
Pneumonia	2193	2012	912
Foodborne intoxication	58	19	0
Cutaneous anthrax	0	117	0

Discussion

In the year 2019, an approximate figure of 5.2 million children who were below the age of 5 experienced mortality, primarily due to causes that could have been prevented. A notable number of 2.2 million deaths were documented among individuals aged 5 to 24 years, encompassing children and young adults. While this figure is comparatively lower than the mortality rate among children under the age of 5 years, it remains significant. According to the findings of the Global Burden of Diseases, Injuries, and Risk Factors 2017 study, there was a notable decline in child and adolescent mortality rates between the years 1990 and 2017. Specifically, the study revealed a substantial decrease of 51.7%, with the number of deaths decreasing from 13.77 million in 1990 to 6.64 million in 2017.[11] The advancements made in the last two decades have exhibited a lack of equity, with significant variations in the causes of illness and death across different geographical regions.[12] The primary causes of morbidity in these countries include neonatal disorders, lower respiratory infections, and diarrhoea. In contrast, it is observed that in nations characterised by a high Socio-demographic Index (SDI), the primary factors contributing to morbidity among individuals within this age bracket encompass neonatal disorders, dermatitis, and anxiety. Furthermore, it is projected that an approximate total of 23 million fatalities will transpire within the time frame spanning from 2020 to 2030, encompassing the demographic of children and young adults on a global scale.[11]

Throughout the period of the Millennium Development Goals, there has been a significant emphasis on the reduction of morbidity and fatality rates in children aged below five years on a global scale. The heightened emphasis on fatality rates in children less than five years of age has resulted in a substantial volume of scholarly inquiry within this demographic in recent decades. This period has witnessed a noteworthy decline of nearly 60% in under 5 fatality rates since 1990.[13–15] Based on the findings of the Global Burden of Disease Study 2019, it was observed that within the category of disability-adjusted life years (DALYs) in children below the age of 10, a total of six infectious diseases ranked among the top ten causes. These diseases encompassed pneumonia, diarrhoeal diseases, malaria, bacterial meningitis, pertussis, and sexually transmitted infections, with a particular emphasis on congenital syphilis. Pneumonia, diarrhoea, typhoid, tuberculosis, measles, bacterial meningitis, and hepatitis B, continue to be the primary factors contributing to illnesses and death, particularly in low and middle-income nations, within this specific demographic.[6] Several potential programs have been identified for enhancing the detection and handling of common illnesses in this specific age group. These interventions encompass the use of micronutrient supplementation as a supplementary approach to treating prevalent infections, administering antibiotics for pneumonia, and implementing comprehensive care packages.[8]

Conclusion

The current study indicates important information about the status of the common communicable diseases in children in Wasit Province, Iraq, during the years 2018, 2019, and 2020.

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Conflict of Interest: None

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