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Prevalence of COVID-19 and measles in Latamber (Karak), Khyber Pakhtunkhwa, Pakistan

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Abstract

COVID-19 and measles are among the highly contagious top killer diseases globally. This is a cross-sectional study aimed to determine the prevalence of COVID-19 in the general population and measles in children aged ≤15 years in Latamber. The data were taken from the official records maintained in the type D hospital in Latamber. Out of the total 18 confirmed cases of COVID-19 in people aged ≥15 years, males accounted for 11 cases (61.1%) against seven cases (38.9%) in females in the study area. The highest prevalence of COVID-19 (94.4%) was recorded in the age group (15-49 y) and in September (50%), while both April and June showed none. Measles was found in children aged >1 year with males showing an overall 53.6% measles. The age group (≥5Y≤10Y) demonstrated the highest prevalence of measles (46.4%) with females (69.2%), followed by 42.9% in the age group (>1Y<5Y) with 60% were males, and 10.7% prevalence in age group (>10Y≤15Y) including males (13.3%) and females (7.7%). Measles was recorded from January through September except for March and August. The highest prevalence of measles (50%) was in 2018, followed by 2021 (Upto Sep: 32.1%), 2019 (14.3%), and 2020 (3.6%). The present study showed that age, sex, and month determined the prevalence of Covid-19 and measles in the study area.

Keywords: COVID-19, Measles, Latamber, Virus, Prevalence.

INTRODUCTION

Coronavirus disease 2019 (COVID-19) pandemic is a global public health dilemma since its emergence in December 2019 in Wuhan, China (Abid et al 2020; Waris et al 2020), and led to more than 172 million confirmed cases and 3.7 million deaths globally until June 2021 [1]. It is caused by novel type severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) with symptoms including fever, dry coughing, difficulty in breathing, tiredness, and loss of taste and smell. The SARS-CoV-2 mainly affects the respiratory system, however also affects the nervous systems, gastro-intestine, and liver of humans, livestock, Bats, mice, and other wild animals [2,3]. While, measles is caused by Morbillivirus [4] symptomized with a runny nose, cough, eye infection, rash, and high fever [5,6]. Both types of diseases are transmitted through contact or by inhalation of air in droplets containing the virus released from patients. Measles is a highly contagious disease and one of the major killer diseases of children in developing countries [7,8].

Pakistan experienced three different waves of COVID-19 including the first wave of COVID-19 began in late May 2020, peaked in mid-June when daily new confirmed case numbers and daily new death numbers reached high points, then ended in mid-July (COVID-19 pandemic in Pakistan – Wikipedia). The first case of coronavirus was reported from Karachi on February 26, 2020 [9]. The highest number of COVID-19 cases and mortality were reported in Punjab, followed by Sindh, Khyber Pakhtunkhwa, and Baluchistan [10]. The confirmed COVID-19 cases were 928,000, with >21,000 deaths, since 26 February 2020 in Pakistan [11]. Pakistan is included among the five nations that showed the highest prevalence of measles cases globally [1,12], and shared 65% of all measles prevalence among 22 countries in the Eastern Mediterranean region [1,13].

The present study aimed to determine the prevalence of COVID-19 and measles based on sex-wise, age-wise, and monthly-wise in the town of Latamber in the district Karak in order to adopt better strategies for control of both type of diseases in the study area.

METODS

Study design

Karak is a district in the southern Khyber Pakhtunkhwa and is

situated at 70.40˚ to 71.30˚ at longitudes, 32.48˚ to 33.23˚ north latitudes. The total area of district Karak is 3372 km^2 and its population is 706,299 (census 2017). Latamber is a town/union council of Karak and is located 29 kilometers to the East of the District Bannu at 33°6'33N 70°52'3E with an area of 306 km^2 and a population of 100,000 (census 2017).

Data collection and maintenance

The data were in the unconsolidated form in the official records maintained by the hostel authority in the type D hospital, Latamber (Karak). Data were collected manually from the official register. Both suspected and confirmed cases were recorded. The confirmed and suspected cases were classified into several age groups including 1-4y, 5-14y, 15-49y, and 50+y for COVID-19 and ≤1Y, >1Y<5Y, ≥5Y≤10Y, and >10Y≤15Y for measles, and monthly consolidated reports were prepared.

Statistical analysis

For Table 1, the Cochran-Mantel-Haenszel test for the association in frequencies, between month, gender, and suspected versus confirmed cases of COVID-19 is not significant (Mantel-Haenszel c2= 7.1205, df = 5, p-value = 0.2118). For the association in COVID-19 cases between months, age and suspected versus confirmed cases, this test was also not significant (Mantel-Haenszel c2= 6.6237, df = 5, p¬-value = 0.2502). For measles (Table 2), the results of the Cochran-Mantel-Haenszel test for the association (in frequencies of cases) between months, age and gender, are not available (too few observations). For Table 3, the results of the Cochran-Mantel-Haenszel test for the association for the prevalence of measles between gender x age x year was again not significant (Mantel-Haenszel c2= 4.8056, df = 3, p-value = 0.1866). For Table 1, The Fisher test p-value for suspected cases (0.5135237) and for confirmed cases (0.2222222) of COVID-19 is not significant (p> 0.05).

RESULTS

Characteristics of all obese/overweight participants

A total of 32 suspected and 18 confirmed cases of COVID-19 were found during the study period (Table 1) from April 2021 through September 2021 (6 months) with females showing a higher prevalence of suspected cases of 71.9% compared to males (28.1%), while males showed 61.1% confirmed cases against 38.9% in females. No confirmed case of COVID-19 was reported for age <15 years. Age group 15-49 y showed 94.4% prevalence of COVID-19 confirmed and 78.1% of suspected cases compared to 5.6% confirmed and 18.8% suspected cases in age group (50+y). The highest confirmed cases (50%) of COVID-19 were found in September, followed by August (27.8%) with the males being dominant. While the COVID-19 case was not recorded in both April and June.

The overall prevalence of measles during the study period from January 2018 to September 2021 showed (Table 2, 3) males with a higher prevalence of 53.6%. No positive case of measles was found in the age group (≤1Y). The age group (≥5Y≤10Y) demonstrated the highest prevalence of measles (46.4%) including males (26.7%) and females (69.2%), followed by 42.9% in the age group (>1Y<5Y) including 23.1% were females and 60% were males. While age group (>10Y≤15Y) showed the lowest prevalence (10.7%) of measles including 13.3% in males and 7.7% in females. Measles was prevailed from January through September except in both March and August and no case of measles was reported during October-September of the study period. The highest prevalence of measles (50%) was in 2018, followed by 2021 (32.1%), and 2019 (14.3%). While, 2020 demonstrated the lowest prevalence of measles, 3.6% (Table 3). Thus, the prevalence of measles is determined by age as well as by sex within the age group of the children as the two age groups (>1Y<5Y and ≥5Y≤10Y) showed either males or females as a dominant group in the study area.

Table 1: Monthly prevalence of suspected and confirmed cases of Covid-19 in Latamber (Karak) during April-September 2021

M	Total		Male		Female		Age groups (years)								% (Total)	
							1-4y		5-14y		15-49y		50+y			
	Sus	Con	Sus	Con	Sus	Con	Sus	Con	Sus	Con	Sus	Con	Sus	Con	Sus	Con
Apr	3	0	2	0	1	0	1	0	0	0	1	0	1	0	9.4	0
May	8	3	2	2	6	1	0	0	0	0	5	2	3	1	25	16.7
Jun	5	0	0	0	5	0	0	0	0	0	4	0	1	0	15.6	0
Jul	2	1	0	1	2	0	0	0	0	0	2	1	0	0	6.3	5.6
Aug	8	5	2	3	6	2	0	0	1	0	7	5	0	0	25	27.8
Sep	6	9	3	5	3	4	0	0	0	0	5	9	1	0	18.8	50
Tot	32	18	9	11	23	7	1	0	1	0	24	17	6	1	-	-
%	64	36	28.1	61.1	71.9	38.9	3.1	0	3.1	0	78.1	94.4	18.8	5.6	-	-

Table 2: Monthly prevalence of measles in children in Latamber (Karak) aggregated for the period from January 2018 through September 2021

M	Total		Age groups (Months/Years)								Total	% (Tot)
	M	F	≤1Y		>1Y<5Y		≥5Y≤10Y		>10Y≤15Y			
			M	F	M	F	M	F	M	F		
Jan	2	1	0	0	1	0	1	1	0	0	3	10.7
Feb	3	2	0	0	1	0	1	2	1	0	5	17.9
Mar	0	0	0	0	0	0	0	0	0	0	0	0
Apr	2	1	0	0	1	0	1	1	0	0	3	10.7
May	2	1	0	0	1	1	0	0	1	0	3	10.7
Jun•	4	5	0	0	4	1	0	4	0	0	9	32.1
Jul	0	1	0	0	0	1	0	0	0	0	1	3.6
Aug	0	0	0	0	0	0	0	0	0	0	0	0
Sep	2	2	0	0	1	0	1	1	0	1	4	14.3
Oct	0	0	0	0	0	0	0	0	0	0	0	0
Nov	0	0	0	0	0	0	0	0	0	0	0	0
Dec	0	0	0	0	0	0	0	0	0	0	0	0
Tot	15	13	0	0	9	3	4	9	2	1	28	100
%	53.6	46.4	0	0	60	23.1	26.7	69.2	13.3	7.7	-	-

Note: ● indicate the seven patients with measles out of total 9 cases found in June were all members of a family and residents of Latamber, who went to the village Shinwa Gadi Khel in Karak and subsequently suffered from the disease.

Table 3: Yearly prevalence of measles in children in Latamber (Karak) during January 2018- September 2021

Year	Total		Age groups (Months/Years)								Total	% (Tot)
	Male	Female	≤1Y		>1Y<5Y		≥5Y≤10Y		>10Y≤15Y			
			M	F	M	F	M	F	M	F		
2018	6	8	0	0	4	3	1	4	1	1	14	50.0
2019	3	1	0	0	1	0	1	1	1	0	4	14.3
2020	1	0	0	0	0	0	1	0	0	0	1	3.6
2021•	5	4	0	0	4	0	1	4	0	0	9	32.1
Total	15	13	0	0	9	3	4	9	2	1	28	-
%	53.6	46.4	0	0	60	23.1	26.7	69.2	13.3	7.7	-	-

Note: M for male and F for female. ● indicate 7 patients of measles in June 2021, were all the members of a family and residents of Latamber, who went to the village Shinwa Gadi Khel in Karak and brought back the virus into Latamber.

DISCUSSION

Pakistan is at high risk of Covid-19 because of the increased influx of travelers from neighboring countries such as China and Iran as the country has already imported the virus [9]. Pakistan has also taken several efforts including setting out special hospitals, laboratories for testing, quarantine facilities, awareness campaign, and lockdown to control the spread of coronavirus [14], and provided two doses of Covid-19 vaccines to the people and conducting a measles vaccination program in the country. Nevertheless, Pakistan stands among the top five countries with the largest number of children not vaccinated against measles up to June 2021 [1]. The current study demonstrated that people living in Latamber are at risk of both COVID-19 and measles.

Sufficient literature is not available on the prevalence of COVID-19 in Pakistan. The highest prevalence of COVID-19 (Table 1) both in males (61.1%) and in the age group (15-49y: 94.4%) was supported by Abid et al. [9]. WHO found out of 4695 cases of COVID-19, 28.2% were females compared to males (71.8%), and also found the overall highest prevalence of the COVID-19 in the age group (20 to 39 y) including females (21.8%) and males (78.2%) in Pakistan. Abid et al. [9] also recorded the highest prevalence of the COVID-19 occurred in age group (22 to 48 y) in Baluchistan, Sindh (22 to 52 y), Punjab (22 to 44 y), and Azad Jammu and Kashmir and Gilgit Baltistan age varies (31 to 60 y). Further, Abid et al. [9] also investigated and found

the majority (48%) of 138 health care professionals were from the age group 21 to 40 y, followed by 40% in the age group (>41 y). WHO declared the majority of the infected health care professionals are males [15].

Male demonstrated an overall higher prevalence of measles 53.6% (Table 2, 3) was supported by Younas et al [5] who found 74 cases of measles in children aged 6 months to 9 years in the district Karak including males were 41 (55.4%) and females were 33 (44.6%). However, the age group (≥5Y≤10Y) showed the highest prevalence of measles (46.4%) including males (26.7%) and females (69.2%) during the study period (Table 2, 3) in contrast to the Younas et al [5] who found the highest prevalence of measles (46%) were recorded in children aged 1≤3 y. Further, Khan et al [16] also investigated 578 children up to age 15 years who suffered from measles in Bannu including 24 (4.2%) were <12 months, 194 (33.6%) were aged (1≤3 y), 254 (44%) aged 3-5 y, 70 (12.1%) were in the aged 5-8 y, and 36 (6.2%) were in the age group (8-15 y). The study also reported 7 patients with measles in June 2021 were all the members of a family who went to the village Shinwa Gadi Khel in Karak and brought back the virus into Latamber.

The overall higher prevalence of COVID-19 in males than females in the study area was because males are more exposed to the disease because of work outside the home (business, trade), attending public gatherings i.e., praying in the mosque, and having social/religious engagement relatively more than females who are mostly confined to their homes. COVID-19 has more prevailed in the people aged 15-49y in the study area because they are more engaged in the aforementioned social activities as compared to the people of the remaining age groups in the study area. While prevalence of Covid-19 was not reported in children <15 y of age because they are mostly confined to their homes in the study area.

Similarly, male children showed an overall slightly higher prevalence of measles than female children in the study area because male children are relatively more exposed to the sources of the disease and thus are more vulnerable to the disease compared to female children in the study area. It is interesting to know that age-wise differences exist in the percentage prevalence of measles between male and female children: as the age group (>1Y<5Y) showed a higher prevalence of measles in males than females, while the age group (≥5Y≤10Y) demonstrated a higher prevalence of measles in females than males may be in part because of the different level of immunity power develop for COVID-19 by males and females at different ages and may be also by their differences in exposure level to the sources of infections at different ages.

CONCLUSION

All three parameters demonstrated the highest prevalence of COVID-19 including male (61.1%), age group (15-49y: 94.4%), and September (50%), followed by age group, 50+y (5.6%), and August (27.8%) in the Latamber (Karak). No COVID-19 case was recorded in age <15 years and in both April and June. Measles demonstrated an overall higher prevalence of 53.6% in males, highest both in the age group (≥5Y≤10Y: 46.4%), and in June (32.1%). Measles was not reported in both March and August and during October-December during the study period. Measles-based age group also determined either males or females as the dominant group. When planning initiatives, attention must be given to the age groups [17].

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Competing interests: The author declares no competing interests.

Ethical approval statement

This research study has been ethically approved by the deputy medical superintendent Dr. Waqar Ahmed of the type-D hospital, Latambar, Karak, Khyber Pakhtunkhwa (No. 117/09/21 (Covid 19) and, No. 118/09/21 (Measles) dated: 14 September 2021).

REFFERENCES

1. Rana MS, Alam MM, Ikram A, Salman M, Mere MO, Usman M, Umair M, Zaidi SS, Arshad Y. Emergence of measles during the COVID-19 pandemic threatens Pakistan's children and the wider region. Nature Medicine. 2021;27(7):1127-8.
2. Wong J, Goh QY, Tan Z, Lie SA, Tay YC, Ng SY, Soh CR. Preparing for a COVID-19 pandemic: a review of operating room outbreak response measures in a large tertiary hospital in Singapore. Canadian Journal of Anesthesia/Journal canadien d'anesthésie. 2020;67(6):732-45.
3. Abate SM, Checkol YA, Mantefardo B. Global prevalence and determinants of mortality among patients with COVID-19: A systematic review and meta-analysis. Annals of medicine and surgery. 2021;64:102204.
4. Park K. 2011 Epidemiology of communicable diseases. In: K Park (ed.), Textbook of preventive and social medicine, 21st ed. Jabalpur, India: Banarsidas Bhanot Publishers, 2011.
5. Younas S, Rehman HU, Saleem A, Walayat B, Naveed SA, Usman B et al. Measles virus outbreak in district Karak, KP, Pakistan. Journal of Entomology and Zoology Studies. 2021;5(4):1655-61.
6. World Health Organization. Manual for the laboratory diagnosis of measles and rubella virus infection. World Health Organization; 2007.
7. Levin MJ, Weinberg A. Measles (Rubeola) In: Hay WW Jnr. New York. 2011:1138-40.
8. Khan A, Ullah O, Ahmad I. Merajuddin 2015 Measles in vaccinated children 1.5 to 3 years of age in a rural community of district Peshawar, Pakistan. Journal of Ayub Medical College, Abbottabad. 2015;27(4):825-8.
9. Abid K, Bari YA, Younas M, Tahir Javaid S, Imran A. Progress of COVID-19 Epidemic in Pakistan. Asia Pacific Journal of Public Health. 2020;32(4):154-6.
10. COVID-19 pandemic in Pakistan – Wikipedia. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Pakistan (22 October 2021).
11. Worldometer 2021. https://www.worldometers.info/coronavirus/ (2 June 2021).
12. Centers for Disease Control and Prevention (CDCP). https://www.cdc.gov/globalhealth/measles/data/global-measles-outbreaks.html (accessed 22 May 2021).
13. Dawn 2019 https://www.dawn.com/news/1520931 (7 December 2019).
14. Waris A, Atta UK, Ali M, Asmat A, Baset AJ. COVID-19 outbreak: current scenario of Pakistan. New Microbes and New Infections.

2020;35:100681.
15. WHO 2020 Pakistan: COVID-19—Situation update as of 7 April 2020 (3:00 pm). Updates: Ministry of National Health Services Regulations and Coordination Dashboard.
16. Khan A, Khan RA, Ahmed M, Khan MS. Prevalence of measles in district Bannu. JPMA. The Journal of the Pakistan Medical Association. 2018;68(3):447-9.
17. Government of Pakistan 2020 Coronavirus in Pakistan. http://covid.gov. pk/. March 27, 2020.

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