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Impact of covid-19 on Essential Immunization (EI) Regarding Vaccine Preventable Diseases District DG Khan, Punjab, Pakistan-2020

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Abstract

Introduction:

EPI schedule immunizes children for 10 diseases namely Tuberculosis, Polio, Diphtheria, Pertussis, Tetanus, Hepatitis B, Meningitis, Pneumonia, Diarrhea and Measles starting from birth till 23 months of age. District DG Khan is located in Southern Punjab having low essential immunization because of geography, mountainous terrain and multiple factors.

Objectives:

This study was carried out to assess the impact of COVID-19 on Essential Immunization status of children in Dera Ghazi Khan and to formulate recommendations for strengthening of Essential Immunization during the COVID-19 pandemic.

Methods:

A Descriptive study was conducted during the month of January-2021 at District Health authority office Dera Ghazi Khan. Data was collected for 2019 and 2020 month wise. Comparison analysis was done antigen and month wise for 2019 and 2020 to see the impact of COVID-19 on Essential Immunization.

Results:

Essential Immunization activities were affected badly during the first three months of start of pandemic. Penta-1 coverage during March 2019 was 95% and it was 56% in March 2020. Penta-1 coverage during April 2019 was 95% and it was 3% in April 2020. Penta-1 coverage during May 2019 was 97% and it was 81% in May 2020. Measles-1 coverage during March 2019 was 94% and it was 68% in March 2020. Measles-1 coverage during April 2019 was 97% and it was 86% in April 2020. Measles-1 coverage during May 2019 was 100% and it was 83% in May 2020. Similarly, all antigens coverage remained low during first three months of pandemic.

Conclusion:

Major reason for low coverage was the community fear and parents were refusal for vaccination because of COVID-19. Outreach sessions for immunization need to be carried out on regular basis by following the COVID-19 SOPs. Social mobilization activities for parent's awareness about vaccination like community awareness sessions for building community trust are recommended.

Keywords: Essential Immunization, COVID-19, Dera Ghazi Khan, Punjab

Introduction

Immunizations against the vaccine preventable diseases are the most cost effective, safe interventions and compulsory component of child health care programs. Effectiveness of immunization depends upon high coverage and equity of access which can influence both individual and herd immunity^[1,12].

Morbidity and mortality caused by the diseases that are preventable by vaccine are still very high in many developing countries like Pakistan and Afghanistan across the world. 15% of deaths in children less than five years of age are attributed to these vaccine preventable diseases. Pakistan is a developing country with infant mortality rate (IMR) of 80/1000 live births. Mortality less than five years of age has been markedly reduced in last 15 years but it is still alarmingly high for Pakistan^[2, 10, 14]. Expanded program of immunization (EPI) was launched in 1976 by WHO and UNICEF with the aim of controlling diseases of children^[3, 15]. All countries have national immunization programme and in most developing countries. Children less than 5 years age are immunized with the standard WHO recommended vaccines that protect against ten diseases namely

Tuberculosis, Diphtheria, Tetanus (including neonatal tetanus through immunization of mothers), Pertussis, Measles, Polio, Hepatitis B, Pneumonia, Meningitis and Diarrhea^[4, 11, 13].

The Expanded Programme on Immunization in Pakistan was initiated as a guide project in 1976 and was launched at federal level in 1978 but was established nation-wide in 1981. In Pakistan, the immunization services are provided to more than 5 million children yearly^[5, 17, 26]. Pakistan EPI schedule involves administering BCG/OPV at birth, 3 doses of Pentavalent, OPV, and PCV 10 at 6, 10, 14 weeks of age, Rota vaccine at 6 and 10 weeks and Measles vaccines at 9 and 15 months of age^[6, 18, 21, 22, 23].

District DG Khan is located in Southern Punjab and epidemiologically it is one of the high-risk districts of Pakistan because it is connecting all the four provinces of Pakistan having boundaries with (Baluchistan and KPK provinces). Entire eastern boundary is riverine and the western boundary is mountainous (Koh-e-Suleman) and this mountainous terrain is covering 53% area of the whole district. Children are immunized for ten diseases in Routine EPI (Expanded Programme on Immunization) schedule before 23 months of age. Routine immunization coverage in Pakistan is 67.5% while in Punjab Province it is 64.1%. Pakistan has shown little progress in achieving the immunization coverage of 90% by 2020^[7, 18, 19, 20].

The objectives of the study are to assess the Essential Immunization (EI) coverage in children less than 2 years of age during the years 2019 and 2020 in District Dera Ghazi Khan and to formulate recommendations for strengthening of Essential Immunization during the COVID-19 pandemic.

Materials and Methods

Study Design:

A Descriptive cross-sectional study was conducted during the month of January-2021 at District Health authority office Dera Ghazi Khan. Data was collected for 2019 and 2020 month wise from DHIS report. Comparison analysis was done antigen and month wise for 2019 and 2020 to see the impact of COVID-19 on Essential Immunization.

Data Collection:

Data Collection Tool:

A semi-structured Questionnaire covering all the variables was prepared by researcher and finalized after pre-testing.

Data Collection Procedure:

After taking consent from district health authority data was collected by interviewing the District Superintendent Vaccination (DSV) and reviewing the data of 2019 and 2020 from DHIS report.

Data Analysis:

Data was entered in the standard questionnaire. The data was cleaned and was analyzed. Frequencies and percentages were calculated and data was presented in tables and graphs.

Ethical Issues:

Formal consent and permission was taken from concerned authority to conduct study. Verbal consent was taken from respondents. Privacy and confidentiality was maintained.

Results

BCG vaccine is given at birth for tuberculosis while four

doses of OPV are given for polio, OPV0 at birth and OPV1, 2, and 3 are given 6, 10 and 14 weeks of age. Significance of OPV3 coverage is that it reflects that a child has received all doses of OPV.

Three doses of Pentavalent vaccine are given Penta-1, Penta-2 and Penta-3 at age of 6, 10 and 14 weeks and it immunizes against Diphtheria, Pertussis, Tetanus, Hepatitis B, Pneumonia and Meningitis.

Two doses of measles vaccine are given at 9 and 15 months of age respectively. Two doses of the Rota vaccine are given at 6 and 10 weeks of age^[9, 24, 27].

Five doses Tetanus toxoid vaccine are given to the females during child bearing age 15-49 years of age and in rural areas who do not get all 5 doses they get at least 2 doses of TT vaccine during 7th and 8th month of pregnancy^[9, 16, 25].

The coverage of all antigens during the month of March 2019 and during March 2020 is as follows^[8];

Table 1

Name of Antigen	Coverage% (March 2019)	Coverage % (March 2020)
BCG	106%	91%
OPV3	96%	82%
Pentavalent-1	95%	56%
Pentavalent-2	98%	53%
Pentavalent-3	96%	49%
Measles-1	94%	68%
Measles-2	93%	67%
TT-1	92%	57%
TT-2	82%	48%

The coverage of all antigens during the month of April 2019 and during April 2020 is as follow^[8];

Table 2

Name of Antigen	Coverage% (April-2019)	Coverage % (April-2020)
BCG	107%	83%
OPV3	96%	93%
Pentavalent-1	95%	3%
Pentavalent-2	98%	2%
Pentavalent-3	96%	2%
Measles-1	97%	86%
Measles-2	94%	83%
TT-1	90%	67%
TT-2	84%	54%

The coverage of all antigens during the month of May 2019 and during May 2020 is as follow^[8];

Table 3

Name of Antigen	Coverage% (May-2019)	Coverage % (May-2020)
BCG	111%	79%
OPV3	99%	72%
Pentavalent-1	97%	81%
Pentavalent-2	101%	74%
Pentavalent-3	99%	72%
Measles-1	100%	83%
Measles-2	99%	77%
TT-1	95%	69%
TT-2	89%	56%

Discussion

Morbidity and mortality caused by vaccine preventable

diseases that are preventable by vaccine are still very high in many developing countries across the world. Multiple demographic and socio-demographic factors influence immunization status of children.

The results of the study showed that BCG coverage during March 2019 was 106% and it was 91% in March 2020. BCG coverage during April 2019 was 107% and it was 83% in April 2020. BCG coverage during May 2019 was 111% and it was 79% in May 2020.

OPV3 coverage during March 2019 was 96% and it was 82% in March 2020. OPV3 coverage during April 2019 was 96% and it was 93% in April 2020. OPV3 coverage during May 2019 was 99% and it was 72% in May 2020.

Penta-1 coverage during March 2019 was 95% and it was 56% in March 2020. Penta-1 coverage during April 2019 was 95% and it was 3% in April 2020. Penta-1 coverage during May 2019 was 97% and it was 81% in May 2020.

Penta-2 coverage during March 2019 was 98% and it was 53% in March 2020. Penta-2 coverage during April 2019 was 98% and it was 2% in April 2020. Penta-2 coverage during May 2019 was 101% and it was 74% in May 2020.

Penta-3 coverage during March 2019 was 96% and it was 49% in March 2020. Penta-3 coverage during April 2019 was 96% and it was 2% in April 2020. Penta-3 coverage during May 2019 was 99% and it was 72% in May 2020.

Measles-1 coverage during March 2019 was 94% and it was 68% in March 2020. Measles-1 coverage during April 2019 was 97% and it was 86% in April 2020. Measles-1 coverage during May 2019 was 100% and it was 83% in May 2020.

Measles-2 coverage during March 2019 was 93% and it was 67% in March 2020. Measles-2 coverage during April 2019 was 94% and it was 83% in April 2020. Measles-2 coverage during May 2019 was 99% and it was 77% in May 2020.

TT-1 coverage during March 2019 was 92% and it was 57% in March 2020. TT-1 coverage during April 2019 was 90% and it was 67% in April 2020. TT-1 coverage during May 2019 was 95% and it was 69% in May 2020.

TT-2 coverage during March 2019 was 82% and it was 48% in March 2020. TT-2 coverage during April 2019 was 84% and it was 54% in April 2020. TT-2 coverage during May 2019 was 89% and it was 56% in May 2020.

This further highlights the need to effectively engage the community health workers and mobile teams regarding immunization, communication after vaccination possible side effects, schedule for next visit. It is also emphasized that the behavior of health workers, their availability and accessibility of the health facilities are the factors that can make a significant difference in immunized, partially immunized and non-immunized children.

Conclusion

Essential Immunization activities were affected badly during the first three months (March, April and May-2020) of the start of pandemic. Major reason for low coverage was the community fear and parents were refusal for vaccination because of COVID-19. Similarly, all antigens coverage remained low during first three months of pandemic. Immunization is the most cost-effective method of protecting children from preventable diseases and therefore a vital part of community healthcare. Present study assessed the impact of COVID-19 on Essential Immunization (EI) regarding vaccine preventable diseases in District DG Khan. Morbidity and mortality of under 5 children is high against ten preventable diseases, making immunization as the most

cost effective method of protecting children against these diseases. In spite of governments and various non-government organizations, Pakistan's progress towards achieving Millennium Development Goals 2015, Goal 5 achieving has been slow because of natural disasters and floods together with poverty especially in southern Punjab to achieve vaccination coverage of 90% in 2015^{25, 26}. Thus this cross-sectional study was conducted in district Dera Ghazi Khan, South Punjab to assess the impact of COVID-19 on Essential Immunization status of children during 2020 in Dera Ghazi Khan and to make suggestions for strengthening of Essential Immunization. The data was collected on a pretested, semi-structured questionnaire.

It was found that coverage of all the antigens like BCG, OPV, Pentavalent, PCV (Pneumococcal vaccine), Measles and Tetanus Toxoid (TT) dropped to lower level resulting in increased disease burden in the community. Furthermore, due to low OPV coverage a surge in polio cases was also observed in district DG Khan as it is epidemiological one of high-risk districts of Pakistan due to its geographic location and there is massive influx of High Risk and Migrant Mobile population in district DG Khan, so the risk of virus importation in this district is always very high. Despite of government efforts and other organizations like WHO and UNICEF who are working in routine EPI, the results are still not encouraging. The efforts to make EPI an integrated part of health system should be increased and parents along with the vaccination staff should be convinced about the importance of the vaccination for the children health following the SOPs of COVID-19 during immunization against vaccine preventable diseases and polio campaigns.

Recommendations

Based on the conclusion it was recommended that the outreach sessions for immunization need to be carried out on regular basis by following the COVID-19 SOPs like use of Masks and Hand Sanitizer. Social mobilization activities for parent's awareness about vaccination like flyers and banners distribution. Conducting regular Community awareness sessions regarding the importance of vaccine against the vaccine preventable diseases for building community trust are recommended. Display of posters in main streets and at each union council was recommended. Availability of vaccinators, Lady Health Workers should be ensured through regular supervision and monitoring by district supervisory staff like DHOs, DDHOs, DSV and ASVs. It should also be ensured that vaccination staff is 100% following the COVID-19 SOPs during vaccination so that the parents and community feel that their child is vaccinated by safe health practices and they are also safe from COVID-19 during this period of pandemic.

Illiteracy is a significant problem in Pakistan that hinders the immunization status of the children. Literacy rate should be increased among population and parents who are illiterate must be educated through media about the timely immunization of their children. Parents should be more vigilant about immunization status of their children and gender bias should be avoided. The parents, who do not care about immunization of their children, must be convinced by health care providers by explaining the importance of immunization. Lady health workers performance should be monitored strictly to obtain full coverage in the area. Misconceptions should be rectified among people about ill effects of vaccination. Importance of vaccination card

should be created among the people that if misplaced, children cannot get timely and proper dose of vaccine. Number of vaccination centers should be increased for the convenience of people. Mobile team should be advised to visit regularly their areas and visits should be increased to provide full coverage. To increase the coverage of immunization, availability of vaccinator should be ensured through supervision and monitoring by health department. Mass media should play its vital role regarding vaccination safety and usefulness. In such way the people who have fear of side effects could also be motivated.

Data Availability

There will be open access to the data to all the readers who will see the data supporting the conclusion.

Conflict of Interest

There is no conflict of interest and submitting authors are responsible for co-authors declaring their interests.

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