

Impact of covid-19 lockdown on immunization at a public tertiary care teaching hospital.

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Abstract

Background: COVID-19 has disrupted immunization activities across the world. There is lack of data from India about the impact of COVID-19 on vaccination, particularly at the ground level. Hence we aimed to study the impact of COVID-19 on immunization at a public tertiary care teaching hospital.

Methods: This is a pre and post lockdown data analysis study. The data analyzed included period before lockdown from 1st January 2020 to 24th March 2020 ("Period 1") and during lockdown from 25th March 2020 to 13th May 2020 ("Period 2") from the immunization OPD of a public tertiary care teaching hospital from Western India. Cumulative doses of vaccines given at weekly intervals during two periods (period 1 and period 2) were tallied. The reduction in number of vaccines given during the two time periods in three vaccine groups viz. vaccines given at birth, vaccines given in infancy and under five children (except MR) and MR vaccine.

Results: Our study shows that there was some decline in the number of vaccines given to newborns in hospital, however, this was not statistically significant ($p > 0.05$). Compared to this, there was a major impact on number of vaccines given in infancy and under five children ($p < 0.005$). We specifically studied impact on the MR vaccine and found there was statistically significant decline in number of children immunized ($p < 0.007$).

Conclusions: There was a major impact of COVID-19 lockdown on vaccines given to infants and children.

Keywords: Covid-19, Immunization, Measles Rubella vaccine, Lockdown.

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Introduction

At least 13.5 million people worldwide are likely to miss out on vaccinations due to postponement of campaigns and interruptions in routine vaccinations, with millions more likely to follow. WHO's Strategic Advisory Group of Experts (SAGE) on immunization recommended that all mass vaccination campaigns should be discontinued, however routine immunization should continue where possible. In keeping with this, the Indian government has issued guidelines advising continuation of routine immunization activities and IAP-ACVIP has issued guidelines for pediatricians in private practice. There is lack of ground level data on actual impact of lockdown on vaccination. Hence we carried out a study to identify the magnitude of decline in routine pediatric vaccine delivery at a public tertiary care teaching hospital [1].

Materials and Methods

This was a data analysis study (retrospective and prospective) carried out at a tertiary care teaching hospital which immunizes children as per the UIP schedule. The study analyzed data from 1st January 2020 till 13th May 2020. Ethical Clearance was obtained from the Institutional Ethics Committee prior to initiation of study. The vaccination center of our hospital was fully functional with adequate manpower and vaccine availability during lockdown. All measures to prevent COVID transmission like observing two meter distance between individuals, frequent sanitization, wearing masks were adhered

to. The data analyzed included period before lockdown from 1st January 2020 to 24th March 2020. ("Period 1") and during lockdown from 25th March 2020 to 13th May 2020 ("Period 2"). Data of immunization for children under five years of age was collected from the computerized records kept in vaccination Centre. This data during the two time periods was entered into predesigned proforma. Cumulative doses of vaccines given at weekly intervals during two periods (period 1 and period 2) were tallied. Specifically, we analyzed the impact of lockdown on three groups of vaccine (Vaccines given at birth, vaccines given in infancy and children below five years of age (excluding Measles Rubella vaccine) and Measles Rubella (MR) vaccine). Weekly data regarding individual vaccines and total number of vaccines during period 1 and 2 was entered in Microsoft Excel 2010 and data was analyzed using IBM SPSS Statistics Version 20 [2].

By using number of vaccinations per week before and during the lockdown, mean number of vaccinations was calculated. Mean vaccinations during the each period along with their standard deviations were compared with the other using independent sample t test. 95% confidence interval of the mean differences was calculated and p value < 0.05 was considered to be the indicator of significant difference in means (Table 1). Bar graphs comparing mean vaccinations per week was plotted wherein the double capped error bars denoted standard deviations (Figure 1).

Results

Our study shows that there was some decline in the number of vaccines given to newborns in hospital i.e.BCG,OPV zero and Hepatitis B (consequent to lesser deliveries) during lockdown, however, this was not statistically significant ($p>0.05$). Compared to this, there was a major impact during lockdown leading to decline in the number of vaccines given in infancy and under five children i.e.Pentavalent vaccine ,Rotavirus vaccine, Injectable polio vaccine ,Oral polio vaccine and DPT booster ($p <0.05$). We specifically studied impact on the MR vaccine and found there was statistically significant decline in number of children immunized ($p <0.05$) Table 1.

Table 1: Comparison of Standard Deviation Scores of individual vaccines before and during lockdown.

Independent Sample t-test for Equality of Means							
Vaccine	Vaccination Period	Number of weeks	Mean	Std. Deviation	t	95% CI of the Mean Difference	P
BCG	Before Lockdown	7	202.43	27.12	0.834	(-26.55 to 59.16)	0.422
	During Lockdown	8	186.13	47.09			
OPV-0	Before Lockdown	7	203.71	42.86	1.454	(-17.12 to 87.55)	0.17
	During Lockdown	8	168.50	50.93			
Hepatitis B	Before Lockdown	7	136.43	20.14	1.119	(-17.07 to 52.18)	0.288
	During Lockdown	8	118.88	38.81			
OPV	Before Lockdown	7	86.14	6.20	3.909	(22.24 to 88.54)	0.005
	During Lockdown	8	30.75	39.53			
PENTAVALENT VACCINE	Before Lockdown	7	67.71	7.99	3.8	(16.93 to 69)	0.005
	During Lockdown	8	24.75	30.82			
ROTAVACCINE	Before Lockdown	7	64.86	6.94	3.816	(16.1 to 65.61)	0.005
	During Lockdown	8	24.00	29.36			
IPV	Before Lockdown	7	46.57	6.50	3.513	(9.85 to 46.55)	0.007

	During Lockdown	8	18.38	21.61			
MR	Before Lockdown	7	29.57	5.19	3.482	(6.56 to 30.83)	0.007
	During Lockdown	8	10.88	14.14			
DPT-BOOSTER	Before Lockdown	7	17.86	2.12	3.93	(4.95 to 19.1)	0.004
	During Lockdown	8	5.88	8.32			

Figure 1 shows bar graphs comparing mean vaccinations per week wherein the double capped error bars denoted standard deviations. It is clear that the impact on vaccines during neonatal period is much less compared to infancy and under five children.

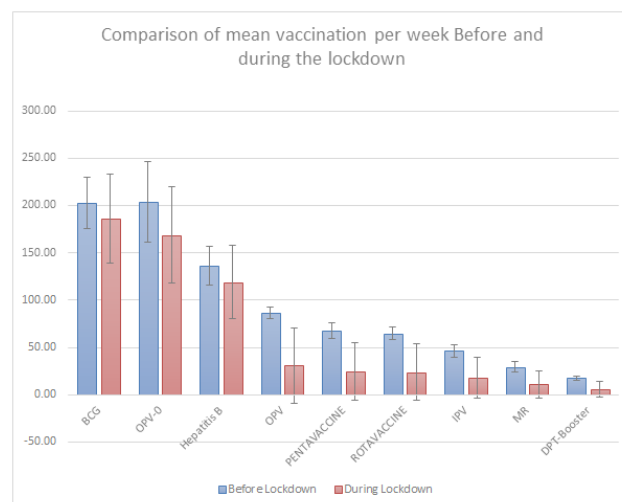


Figure 1. Bar diagram showing comparison of mean vaccination per week before and during the lockdown.

Discussion

This is the first published study to our knowledge from India that has assessed, on the ground level, the actual impact of lockdown on vaccination at a public tertiary care teaching hospital. Our study shows substantial impact on vaccine delivery to infants and young children including the MR vaccine in a government institute [3]. Our study showed less impact on the BCG, OPV zero and Hepatitis B (first dose) vaccination. This may reflect success of institutional delivery policy. The minor decline in the number of vaccines given to newborns (BCG,OPV zero and Hepatitis B first dose) may be because of the reduced number of deliveries during lockdown due to unavailability of transport. Counseling of mother at discharge after delivery for immunization (6 week dose) is important. There could be multiple reasons for decline in uptake of vaccination as outlined in IAP-ACVIP guidelines and in our previous publication [4]. Our institute being located

in one of the hotspots of COVID-19, the impact could be more pronounced here as there was no public transport available during lockdown. Also, since our institute was declared a COVID hospital (although the COVID building is a standalone building situated away from the main hospital), parents might be scared to get children for vaccination to our hospital. Our study also shows that the government guidelines have not reached intended audience (parents of young children). Electronic and social media has not been adequately utilized for awareness of importance of immunization. Government needs to urgently promote vaccination by ramping up IEC activities [5].

Conclusion

The likely impact of stopping mass OPV immunization and the fear of resurgence of polio has been published, but over study shows significant decline in polio vaccine uptake (oral and injectable) even in routine immunization. The decline in MR (Measles containing vaccine) is a matter of great concern for public health. In Africa the increase in measles cases during the Ebola outbreak in 2013-2016 was caused by disruption of vaccination programs and underreporting of measles diseases cases. It will be important to focus on high-quality supplementary immunization activities and strengthening of routine immunization to address gaps in immunity among children as India cannot afford outbreaks of VPDs, particularly when the health care system is already stretched due to COVID-19. We would not want a second crisis that could kill as many as persons as the original outbreak, if not more. Reminding parents of the vital need to protect their children against serious vaccine-preventable diseases, even as the COVID-19 pandemic continues, is critical. As social distancing requirements are relaxed, children who are not protected by vaccines will be more vulnerable to diseases such as measles and polio. Our study has some limitations. This is a

single center study from a “red zone”. Also we did not study immunization data of children above five years of age. Larger studies from all over the country are necessary to assess the full impact of lockdown on immunization.

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