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A story based research in District Abbottabad for eradication of Polio in Pakistan needs acceptance of the vaccine

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Abstract
Pakistan is an endemic country in 2014 most of the polio cases were studied. The new strategies were built for success in 2015 to eradicate the polio from the country. One of the strategies was to use only bivalent oral polio vaccine for routine immunization because the bivalent is most efficient as compared to trivalent oral polio vaccine. The study was held at district Abbottabad in the last month of 2015 for polio vaccination. However, in district Abbottabad there is no case of polio since 2001 but the refusal cases still exists. The total recorded refusal cases were 51 which were covered up to 47. The total target for administering the polio vaccine in this district was 216508 out of which 94 percent of administration succeeded. Also in starting month of 2016, the IPV immunization also started for the children of 14 to 15 weeks old. A single dose of IPV is administered to the children.

Keywords: Polio, Vaccine, district Abbottabad

1. Introduction

1.1 Polio

Transmission of polio virus occurs by the fecal oral route or the presence of airborne droplets in drinking water or food. When the viruses transmitted to the body via the mouth or nose it goes to the intestinal tract where it multiplies and increase its number. After infecting the intestines and increasing its numbers the viruses travel to the blood stream of infected persons where the immune system awakes and starts the production of antibodies against the virus due to which in most of cases the infected persons gain the permanent immunity against the polio virus [1]. But this concept is wrong because in most cases, i.e. 95 percent of infected persons did not acquire any symptoms, even in epidemic conditions. 5 percent of total cases show the milder symptoms like fever, stiffness of neck, sore throat and headache [2]. 1 out of 1000 infected persons shows the Paralysis of the muscles. Permanent paralysis in the polio is rare, mostly regain of muscle power starts after some days, which continues for about 12-24 months. Respiratory muscle paralysis due to polio virus that leads to death is also rare [2, 3, 4].

1.2 Vaccine against Polio virus

An American microbiologist and physician named Jonas Salk, in 1952 starts the development of polio vaccine by combining three types of polio virus which were grown in cultures, i.e. made from monkey kidneys by using formaldehyde he inactivated the pathogenic activity of polio virus for triggering the immune response of body without causing the disease. In April 1954 the first polio vaccine campaign was launched at school and immunizing the school children against polio virus. However, due to this vaccination campaign against polio virus hundreds of people become infected with polio viruses and died because of the incomplete inactivation of polio virus in vaccines. The vaccines were then stopped and redeveloped in August 1955 which were then used in the US and administered over 4 million doses [1].

Another American microbiologist and physician named Albert Sabin in 1957 started development of another type of polio vaccine known as a live-virus (oral) vaccine, which will be more effective than Salk's killed-virus vaccine in controlling epidemic cases. He used to weaken live polio viruses for such purpose. After developing the live polio vaccine he first experimented with them on monkeys and chimpanzees for checking the potency of his developed

vaccine against polio that whether the virus present in vaccines penetrate the central nervous system or not. It was tested on humans in 1958 in the US while for general use Sabin's oral vaccine became available in 1963 [1].

1.3 Eradication of Polio

For the eradication of polio a global effort was started in 1988 which was led by the organizations named WHO, UNICEF, and The Rotary Foundation. These organizations, mostly rely on Oral Polio Vaccine (OPV) for eradication of polio worldwide. In about more than 95 percent of persons produce immunity against all 3 types of polio viruses' by administering 3 doses of OPV [1].

In polio eradication plane different types of vaccines are used against polio viruses which are tOPV (trivalent) which provide immunization against all three types of poliovirus; bOPV (bivalent) which provide immunization against polio virus type 1 and 3; or mOPV1 (monovalent) which provide immunization against poliovirus type 1 [6].

By the use of polio vaccines in eradicating plan for polio worldwide the cases of polio have decreased for about 99% since 1988, which were estimated about 350 000 cases every year in more than 125 endemic countries before the start of eradication plan. Worldwide polio cases were decreased in 2010 to 1352 cases and then in 2011 to 650 cases and in May 2012 the polio cases were 60 worldwide. The three countries remain endemic for polio, which is Afghanistan, Nigeria and Pakistan in the whole world. By the use of the polio eradication plan, in many countries of the world the health service system is strengthening b much man investment, spreading a network of global laboratory and also training local epidemiologists in countries, now GPEI has expanded its capacity to control and eradicate also other infectious diseases such as Ebola or avian influenza worldwide. This capacity of GPEI has been brought into action for 2010 floods in Pakistan and the 2011 drought in the Horn of Africa [7].

1.4 Polio vaccination in Pakistan

In April 1994 the campaign for Polio immunization by use of polio vaccination was started in Pakistan and are still going in progress [8]. In the year of 2009, worldwide from 23 countries the reported polio cases were 1,604 out of which 89 cases were from Pakistan. While in the year of 2010, in Pakistan most of the cases were reported mainly from Federally Administered Tribal Areas (FATA), Khyber Pakhtunkhwa, Karachi and Balochistan. The cases were about 134.

2014 was the worst year for Polio eradication in Pakistan, contributing almost 85 percent of polio cases worldwide in this year 2015. Due to which there is also a risk for spreading the polio viruses to other countries across the borders of Pakistan, therefore WHO recommended the polio vaccination for all travelers from Pakistan before a month for travelling across the border.

In Pakistan there are no cases of wild polio viruses' type 2 since 1999 or type 3 since 2012. Since 2013 all the reported polio cases in Pakistan are of wild polio virus type 1[8, 9]. For controlling these situations in Pakistan it is recommended to administer also IPV one dose a routine vaccination [10]. This IPV dose of vaccines helps in enhancing the immunization against poliovirus in those persons whom show no response to OPV doses. Secondly trivalent OPV replaced with bivalent OPV for routine immunization against polio virus because bivalent OPV is more immunological than trivalent in routine vaccination.

1.5 Polio vaccination in District Abbottabad

The polio vaccine mostly used in Pakistan is a bivalent oral polio vaccine. The polio vaccines are of two types they are OPV and IPV. The OPV has also further more types such as monovalent, bivalent and trivalent. In Pakistan now a day's mostly bivalent oral polio vaccine are used and mostly they are used for children less than 5 years old because less than 5 years old children are most susceptible to polio virus and mostly their transmission route is the fecal oral route. Therefore, if any flaccid case comes in less than 15 years old children, their stool sample is collected and sent to NIH Islamabad for diagnosis that whether the case is due to polio virus or due to some other reason. The doses of OPV bivalent are 2 drops for each child and given to all of those children which are under 5 years age. The second type of polio vaccine, which is IPV is recently launched in Pakistan in January 2016. They are given to the children at the age of when they are 14 to 15 weeks old. At that time only one injection was given to such children. These vaccines are imported from Italy and France.

In 2015 the target at district Abbottabad region was to vaccinate 217508 children. In which, about 203304 targets were covered. From 2001 there is no polio case in Abbottabad region. The refusal cases at district Abbottabad were 300 to 400 cases, but now they are decreased up to 2 to 5 cases because now the commissioner of Abbottabad police has given the strictest orders for vaccination. So such refusal cases are now decreased by force of police to vaccinate their children.

Every month 3 days campaigns are done for vaccination of children at houses, schools even in the streets. Those children whom are not available at home the campaign workers at 4th or 5th day visit those homes and vaccinate those children. Day to day all of the data, i.e. vaccinated children at home at street at schools and not available children was given to health officers and collected there.

In 2015 at district Abbottabad region the targeted population for vaccination was about 217508 in which about 94 percent was covered in different campaigns i.e. 203304 children were vaccinated at different campaigns and catch up in district Abbottabad. The summary of coverage is shown in table1 and graph1.

Table 1: Coverage summary

Total Target	**217508**
Total percentage	94%
Total coverage	203304
Cover during the campaign	153098
Cover during catch up	50206

The children which were not present at home during a visit of workers their summary is about 19106 children were not available at home in which about 5572 were covered during the campaign by visiting the workers again at their home and 9658 children were vaccinated during catch up while about 3849 children were remained unvaccinated shown in Table2 and graph1. The refusal cases also present here in Abbottabad region due to different reason about 51 total refusal cases were recorded in 2015 at district Abbottabad in which 18 were covered during campaign and 29 were covered during catch up while about 4 cases of refusal still present here due to which their children remain unvaccinated (Table3, Graph2).

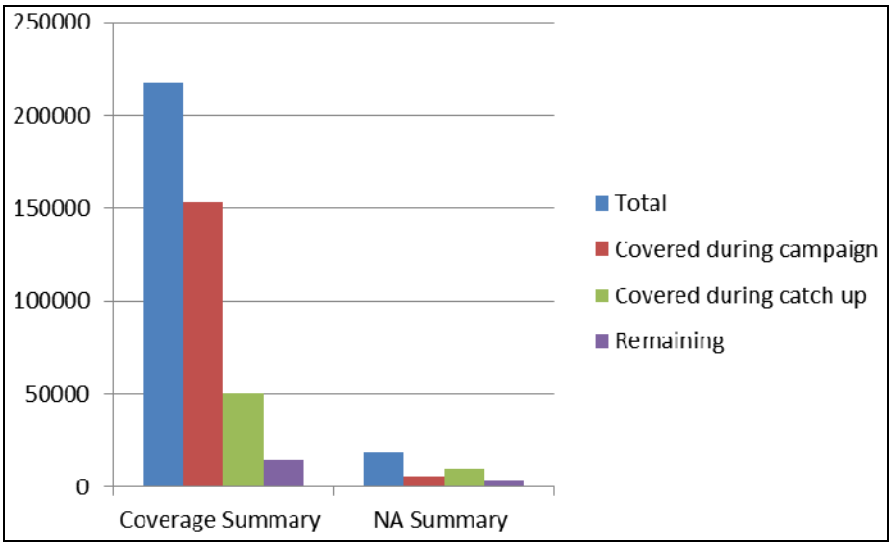
Table 2: NA summary

Total NA Recorded Children	19106
NA covered during the campaign	5572
NA covered during catch up	9685
Still NA children	3849

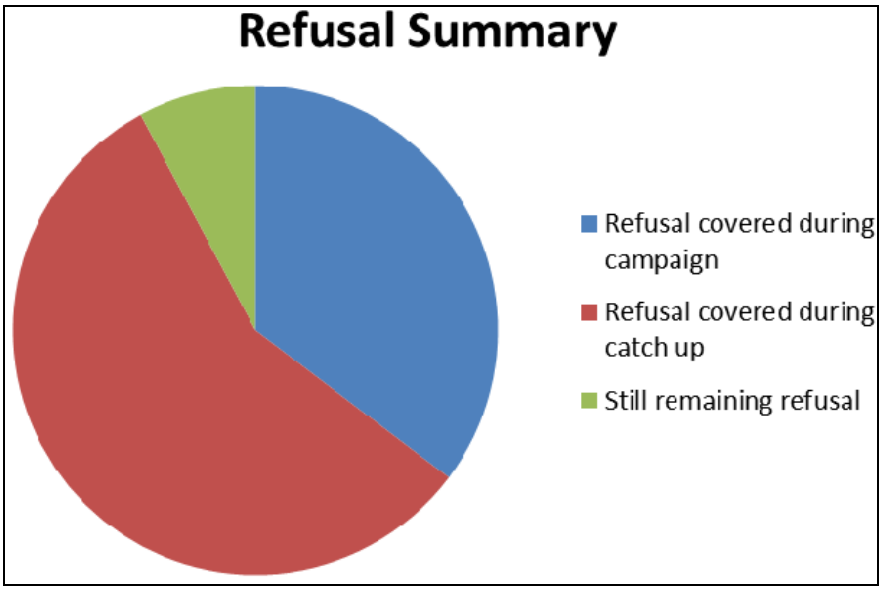
Table 3: Refusal Summary

Total Refusal Recorded	51
Refusal covered during the campaign	18
Refusal covered to catch up	29
Still refusal remaining	4

A total team of polio workers for vaccination at district Abbottabad region in 808 and the children at the age of up to 1 year, which were vaccinated in year of 2015 were 26854 while the children above than one year and up to 5 years which were vaccinated were 176450. Zero doses mean the administration of vaccines to the children for the first time which were about 1092. All of this data about workers team, their target, their coverage and refusal cases, and not available children all are shown in the table according to union council separately in table4.



Graph 1: Total coverage and NA summary



Graph 2: Refusal summary from vaccination.

2. Conclusion

As Pakistan is one of the most endemic country in world for polio cases in which 2014 year is the worst year for polio eradication. This study was carried out in December 2015 at district Abbottabad, Pakistan to check the immunization against polio in this district. The total target for administering the polio vaccine in this district was 217508 out of which 94 percent of administration succeeded. The polio vaccine administration team visits home from home and even in the streets, they administered the vaccines to children for the purpose of eradicating the polio vaccine in this area. In district Abbottabad there is no case of polio since 2001 but still the refusal is present. The total recorded refusal was 51 which were covered up to 47. Now the IPV administration has also started in Pakistan from 2016 which is also a succeeding step towards the eradication of polio. This result shows that at the end of 2016, we will be succeeded in the eradication of polio from whole Pakistan.

S.No	Union Council	Teams	Total Target	0-12	12-59	Total Coverage	Percentage	NA Recorded	Ref Recorded	NA Covered	Ref Covered	Zero Dose
1	Atd cantt 1	16	4000	418	2828	3246	81	216	0	25	0	88
2	Atd cantt 2	16	5527	680	4481	5161	93	503	8	103	3	0
3	Atd cantt 3	16	4923	631	3973	4604	94	183	0	38	0	10
		48	14450	1729	11282	13011	90	902	8	166	3	98
4	Bagh	11	2917	273	2771	3044	104	228	0	57	0	4
5	Bagnoter	9	1810	186	1174	1360	75	147	0	38	0	4
6	Bakot	23	4940	503	3919	4422	90	334	0	85	0	5
7	Baldheri	14	5200	921	4439	5360	103	359	3	80	2	4
8	BP Khan	22	6727	1034	5235	6269	93	548	1	252	0	20
9	Banda Atai KHAN	18	5210	764	4413	5177	99	522	1	124	0	3
10	Biran Gali	11	2618	227	1907	2134	82	155	0	54	0	1
11	Birot	20	4500	600	3288	3888	86	485	6	167	0	1
12	Boi	17	3856	409	3358	3767	98	337	0	234	0	0
13	ATD Urban	7	2510	487	2185	2672	106	226	0	50	0	0
14	Chamad	10	3400	483	2794	3277	96	279	0	163	0	0
15	Namli Maira	12	2922	293	2335	2628	90	722	1	15	0	4
16	Dalola	13	4008	427	3483	3910	98	296	0	90	0	0
17	Dhamtuor	17	4523	692	3687	4379	97	290	0	90	0	2
18	Havalian cantt	10	3774	393	2892	3285	87	561	0	68	0	0
19	Jeral	6	1317	250	1023	1273	97	111	0	70	0	0
20	Jhangi	24	7632	1243	6764	8007	105	876	8	254	0	209
21	Kakul	16	5000	640	4168	4808	96	585	2	189	0	44
22	Urban Kehal	16	5676	479	5053	5532	97	668	0	50	0	0
23	Kothiala	12	2976	305	2525	2830	95	293	0	94	0	0
24	Kokmung	10	1674	170	1355	1525	91	121	0	53	0	3
25	Kuthwal	8	1930	277	1317	1594	83	199	0	67	0	0
26	Malikpura ATD	9	3560	378	3318	3696	104	381	2	68	2	26
27	Mirpur	21	8254	1204	6649	7853	95	660	0	116	0	212
28	Nagri bala	13	3015	377	2206	2583	86	229	0	59	0	17
29	Nathia Gali	13	2827	284	2377	2661	94	164	0	19	0	9
30	Nawan sher	20	6226	940	5466	6404	103	783	3	130	3	92
31	Numbal	13	2651	279	2344	2623	99	229	0	78	0	30
32	Pattan Kalan	23	4200	375	3583	3958	94	186	0	95	0	2
33	Pawa	18	4321	487	3493	3980	92	316	5	131	5	18
34	Phalkot	7	2000	194	1524	1718	86	137	0	26	0	6
35	PK Khan	13	2900	260	2529	2789	96	193	0	127	0	7
36	Pluck	26	5185	357	3940	4297	83	178	0	34	0	0
37	Salhad	26	6107	921	4734	5655	93	835	3	313	1	31
38	Sarbana	15	3223	393	2736	3129	97	268	0	66	0	12
39	Seer Gharbi	12	3404	372	2788	3160	93	112	0	30	0	4
40	Seer Sharqi	6	1375	153	1208	1361	99	42	0	12	0	12
41	Sherwan	18	3925	386	3285	3671	94	297	1	196	0	3
42	Sheikhul Bandai	17	6800	807	4355	5162	76	763	6	177	2	19
43	Tajwal	6	1326	204	950	1154	87	161	0	10	0	8
44	Dewal Mananal	12	2768	317	2579	2896	105	157	0	62	0	0
45	Garhi phul garan	18	4800	651	4084	4735	99	461	1	87	0	27
46	Goorini	11	2230	196	2012	2208	99	134	0	92	0	17
47	Havalian cit	16	4978	617	3758	4375	88	654	0	125	0	7
48	Jhangra	17	4413	694	3887	4581	104	472	0	97	0	56
49	Langra	18	5676	813	4418	5231	92	615	0	181	0	1
50	Langrial	11	2825	364	2305	2669	94	243	0	142	0	0
51	Lora	14	4050	310	3555	3865	95	345	0	225	0	43
52	Majohan	15	3050	478	2377	2855	94	134	0	38	0	3
53	Nagri Totial	10	2244	241	1910	2151	96	170	0	133	0	10
54	Nara	16	3400	382	2886	3268	96	155	0	69	0	0
55	Phaila	13	3760	521	2919	3440	91	283	0	100	0	0
56	Kalabagh cantt	7	1445	114	908	1022	71	105	0	24	0	18
	TOTAL	808	217508	26854	176450	203304	94	19106	51	5572	18	1092

Table4. Vaccination, refusal cases, NA recorded and covered in all Union Councils of District Abbottabad

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