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Awareness of Injectable Polio Vaccine among Doctors of Government Hospitals in Abbottabad

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ABSTRACT

Introduction: *IPV was introduced in areas of northern KPK, Quetta, and Karachi. The success of polio eradication and endgame strategic plan 2013-2018 depends upon doctors' knowledge and approval of IPV. Aim of this study was to assess doctors' knowledge and perception regarding IPV.* ***Methodology:*** *A descriptive cross-sectional study was conducted on doctors in government hospitals of Abbottabad, Pakistan from January 2017 to June 2017. A sample size of 250 was calculated using WHO sample size calculator at 95% confidence level. A pretested questionnaire was used to collect data after taking informed consent. The analysis was done in SPSS version 21.* ***Results:*** *IPV's advantage of being administered exclusively as well as a booster dose was known to 36%. Other merits of IPV like, no requirement of special cold chain storage and no incidence of VAPP (Vaccine Associated Paralytic Poliomylitis) was known by 7.6% and 56.54% respectively. Only 25% of doctors knew about latest endgame strategic plan 2013-2018 and National Emergency Action Plan.* ***Conclusion:*** *Doctor's knowledge and acceptance regarding IPV was very low. Most of the doctors still preferred OPV over IPV as they fear injection pain due to IPV and are not much aware of IPV's advantages over OPV. Thus clear-cut strategies need to be established for sensitization and education of doctors and correspondingly the masses regarding IPV.*

Keywords: Awareness, Perception, Doctor, IPV, End-game strategic plan 2013-2018

INTRODUCTION

Tremendous progress has been made globally regarding polio fight since 1988 when World Health Assembly resolved to eradicate this disease. Worldwide polio has decreased from 350,000 in 1988 to 784 in 2003 and 359 in 2014. Polio vaccines are one of the greatest medical success stories of the 20th century. Before polio vaccines were developed, no illness inspired more dread and outright panic than polio did [1].

Poliomyelitis is said to have first occurred nearly 6,000 years ago in the time of ancient Egyptians. The evidence for this is the withered and deformed limbs of certain Egyptian Mummies [2]. Polio is a highly infectious disease caused by a virus following an incubation period of approximately 7-10 days. About 24% of those infected develop clinical signs such as fever, headache, and sore throat while in about 1% the virus invades the nervous system and can cause total paralysis. The poliomyelitis virus is an RNA containing virus and is a subtype of Enterovirus. The virus is 27 nm in diameter, the virion is in the form of an icosahedron with 32 protein capsomeres, enclosing an RNA core which constitutes 25-30% of the particle. The virus enters the body through mouth and multiplies in the intestine. Once inside the body, the poliovirus multiplies in the throat and intestinal tract then travels through the bloodstream where it infects the brain and spinal cord. Initial symptoms are fever, fatigue, headache, vomiting, stiffness in neck and pain in limbs. In later stages it can be neurotropic, affecting motor neurons, spinal cord, and brainstem [3]. Surprisingly, 95% of all individuals infected with polio have no apparent symptoms. Another 4-8% of infected individuals have symptoms of minor, non-specific nature, such as sore throat, nausea, vomiting, and other common symptoms of any viral illness. About 1-2% of infected individuals develop non-paralytic aseptic viral meningitis, with temporary stiffness of the neck, back, and/or legs. Less than 1% of all polio infections result in the classic "flaccid paralysis"

where the patient is left with permanent weakness or paralysis of legs, arms, or both. Among those paralyzed, 5-10% die when their breathing muscles become immobilized [4].

Polio mainly affects children under 5 years of age. There is no cure for polio it can only be prevented, vaccination is the best way to do so. Polio vaccines given multiple times can protect a child for life. There are two types of polio vaccines:

- Trivalent oral (live, attenuated) polio vaccine (OPV)
- Inactivated or killed polio vaccine (IPV)

Trivalent oral polio vaccine consists of live, attenuated polioviruses, and is a safe and effective vaccine. OPV is given by mouth and its cost is low. The vaccine produces both intestinal and serologic immunity. As a result, children immunized with OPV are unlikely to spread wild poliovirus to other children. A disadvantage of OPV is that, for every 10 million doses administered, approximately 3 children will experience vaccine-associated paralytic poliomyelitis and its storage and transport is also an issue. OPV is the least stable of the Expanded Program of Immunization (EPI) vaccines. It can lose potency if exposed to temperatures above 8°C. Storage at temperatures below -15°C to -20°C halts deterioration in vaccine potency. This maintenance is possible with "cold chain system" which is a system of storage and transportation of vaccines at low temperatures from the manufacturer to the actual vaccination site.

IPV prevents paralytic polio by producing sufficient antibodies in the serum to prevent poliovirus from entering the nervous system. To eradicate polio 4 doses (injections) of Inactivated Polio Vaccine (IPV) are given according to the following schedule.

- 2 months old
- 4 months old
- Between 6 and 18 months
- A booster between 4 and 6 years

IPV is 90% effective after 2 doses and 99% effective after 3 doses. Because the vaccine contains inactivated (killed) poliovirus, it cannot cause polio as a result of reactivation of the virus. Compared to OPV, IPV is a new vaccine which is more effective but also more costly than the Oral Polio Vaccine (OPV). IPV is also easy to handle and transport because it does not require any cold storage facility as required by OPV [5].

After about 20 years of effort which involves more than 200 countries, 20 million volunteers, and international investment of US$3 billion, lead to success of the Global Polio Eradication Programs. Now when the world been so close to success, Pakistan is one of the few remaining countries in world where poliomyelitis is stilled categorized as an endemic viral infection [6]. As of October 2015, there have been 38 documented cases of poliovirus in past year [7]. Though the polio immunization campaign in Pakistan started in 1974 the efforts for eradication officially started in 1994. The infection remains endemic despite over 100 rounds of vaccination being carried out in the past decade. Pakistan had the world's highest number of polio cases in 2014, number of polio cases reached 306, the highest it has been since 2000. However, the number of cases in 2015 are a fraction of those recorded in 2014. The country has announced a goal of polio eradication by 2016. In August 2015, the country launched an injectable polio vaccine intended to treat 4 million children and bring Pakistan closer to its goal of eradication by 2016. IPV is the newer version of polio vaccine which requires a doctor administration [8].

Some of the leading reasons which slow the eradication of polio in Pakistan are political unrest, poor health infrastructure, doctors and government negligence, misinformation campaigns, perceptions of Pakistani parents, religious issues and myths (some people think that polio vaccine contains pig fat or alcohol; two things that are forbidden in Islam. Whereas other people with low literacy rates are of the view that the vaccine will sterilize their children). A lot of parents refused to vaccine their children on religious grounds [9]. From these perspectives it becomes evident that doctors' awareness and their contribution at general and provincial level is a necessity to eradicate polio completely from Pakistan. Doctors awareness regarding IPV helps a lot in promoting IPV campaign as they can convince parents, supervise the designated staff. They can help out in finding accurate measurements to prevent polio and reasons of parental disapproval. Therefore, as a future doctor of Pakistan, we believe that doctor's awareness regarding polio is a key towards immunization of population and complete eradication of polio from Pakistan.

A lot of past researches had been done on the effects of physicians' awareness on immunization choices of parents. In many past studies like the one carried by Seigel RM in 1996, doctors' perception on immunization has been accessed as it is believed that their role in enhancing effectiveness of vaccination programs cannot be denied [10]. In a research carried out by Epeebounya in 2001, it was seen that 58% parents said vaccination choice depends on their doctor's recommendation. It also showed that when parents were given all OPV/all IPV and sequential IPV/OPV schedule option, they responded such that 25% chose all OPV, 13% chose all IPV and 21% chose sequential IPV/OPV [11].

Another research carried out in 2001 by Kolasa MS and Attica showed that after physician's recommendation and provision of adequate information, parents chose IPV over OPV as they now feared VAPP more than injection pain [12].

In a study by William SE it was seen that after imparting information to vaccine-hesitant parents vaccine uptake by parents increased [13].

A study by Mansuri FA revealed that lack of parental compliance to immunization was mainly due to the lack of encouragement of parents by the physicians and their inability to respond to parental query and concerns [14].

Most of the world is now free from polio even Nigeria has celebrated 2014 as a polio-free year, now only Pakistan and Afghanistan are harboring the virus and they are repeatedly transmitting each other because of substantial population movement within and between the two countries. In Pakistan persistent wild poliovirus transmission is restricted to 3 groups:

- Karachi city
- Quetta
- FATA and KPK, 14 and 12 cases were reported in Peshawar and Bannu respectively, 139 cases of polio were recorded in FATA

That's the prime reason why IPV was initially introduced in KPK in several districts like Abbottabad and northern areas and that made the focus of our study in Abbottabad. This study is an attempt to answer the queries with special reference to examine the role and awareness of doctors regarding IPV in Abbottabad. Abbottabad being the epicenter of the influx of internally displaced people needs all the attention and planning up to the grass-root level. So we chose Abbottabad to be our area of research. Millions of people in Pakistan who would otherwise be paralyzed will be walking if immunized against polio with the coordination and awareness of doctors.

Objectives

- To find out awareness regarding IPV among doctors in government hospitals in Abbottabad
- To find out the perception of IPV versus OPV among doctors

Operational Definitions

Perception: Become aware of something through senses, to understand and interpret.

Respondents: Doctors of DHQ hospital and Ayub Teaching Hospital who have willfully consented to participate in research.

Levels of Awareness:

- Unaware: Little information on polio and IPV (answered <8 of the questions correctly)
- Partially Aware: Moderate information on polio and IPV (answered 8-13 of the questions correctly)
- Fully Aware: Complete information on polio and IPV (answered >13 of the questions correctly)

Awareness: Having or showing realization, perception or knowledge about a state or situation.

MATERIALS AND METHODS

Setting

District Head Quarters Hospital and Ayub Teaching Hospital Abbottabad.

Duration of Study

6 months (from January 2017 to June 2017)

Sampling Technique

Non-probability convenient sampling

Sample size

A sample size of 250 was considered for the study.

Study design

Descriptive cross-sectional study

Study Population

Medical practitioners and house officers of DHQ hospital and Ayub Teaching Hospital Abbottabad.

Sample Selection

Inclusion criteria: Medical practitioners and house officers were included in the study.

Exclusion criteria: Medical practitioners dealing with emergency cases and those not present on the day of questionnaire distribution were excluded from the study.

Data collection: Data was collected by visiting DHQ hospital and Ayub Teaching Hospital Abbottabad and carrying out questionnaires. Pretested questionnaires consist of questions of mixed nature containing both closed and open-ended questions. The questions allowed us to evaluate the awareness of IPV among doctors.

Questions will evaluate

- Knowledge about polio disease
- Knowledge about dosage schedule and handling of IPV
- Knowledge about the adverse effects of IPV
- Knowledge about the latest programs to eradicate polio

Methods of data collection: After taking the consent of the medical practitioners, we asked them to fill the questionnaires.

Data Analysis

Data analysis is done using SPSS version 21. Descriptive statistics were applied; tables and bar charts were plotted to represent the data. The age was grouped into 5; 20-30 years, 30-40 years, 40-50 years, 50-60 years and >60 years of age. The reason for grouping age into this much extensive categories is the attempt to find out the age group which is well aware of the IPV and thus it would indicate any improvement in the process of eradication of polio in Pakistan. The respondents (doctors) were asked about the various aspects of IPV and polio disease, about the basic knowledge of the disease process, the types of vaccinations available, emphasis upon the differences between the types of vaccinations, specifically the adverse effects produced by each type, and the latest programs with their objectives launched in Pakistan in order to eradicate polio disease. The research goals to figure out the population of doctors, whether they are actually ready or, in other words conscious enough to eradicate this disease from Pakistan.

RESULTS

Age of the Doctors

The mean age of doctors who participated in the survey lied around 20-35 years of age, as seen below in Figure 1 and it is a valuable data since the future of the country lies in the hands of the youth.

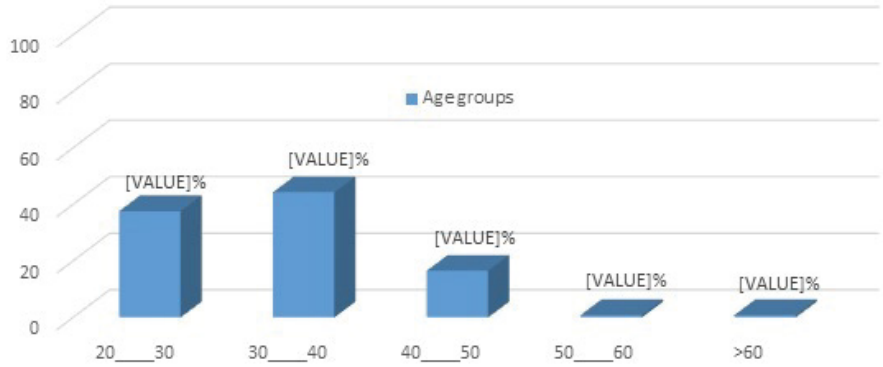

Figure 1 Age groups

Polio Disease

The knowledge about polio disease and about its presence in Pakistan was known to 100% of doctors as expected.

Knowledge about Vaccines used to Eradicate Polio

About 0.4% of the doctors answered only 'IPV', 41.8% of the doctors answered 'OPV' only, and the rest (57.4%) answered 'both' are used. The correct answer to this question is "both" (Figure 2).

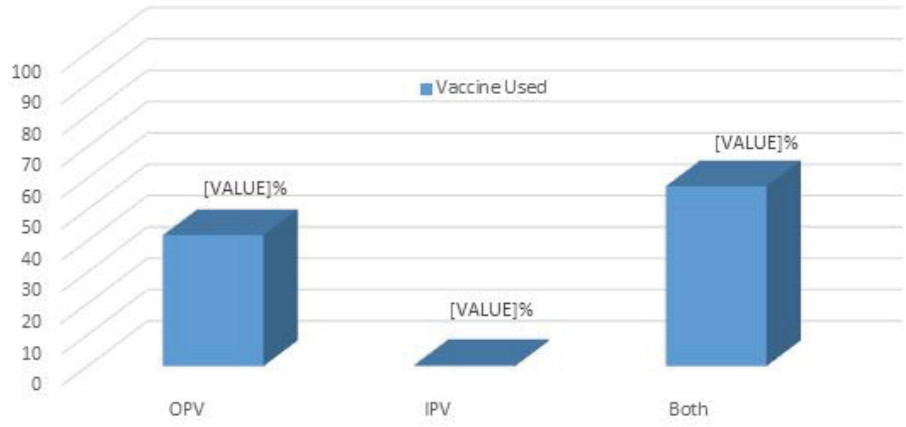

Figure 2 Which vaccine is used in Pakistan to eradicate polio?

Knowledge about the Adverse Effects of IPV

The doctors were asked about their knowledge of adverse effects that could possibly be caused by IPV. About 57.8% of the doctors knew about the adverse effects whereas, 42.2% did not know about the adverse effects of IPV. Among the doctors which knew the adverse effects, 2.5% of the doctors knew all four, whereas 8% knew 3, 16.9% knew 2, and 32.1% knew only 1, of the 4 main adverse effects which might be prevalent on administration of IPV (Figure 3-5).

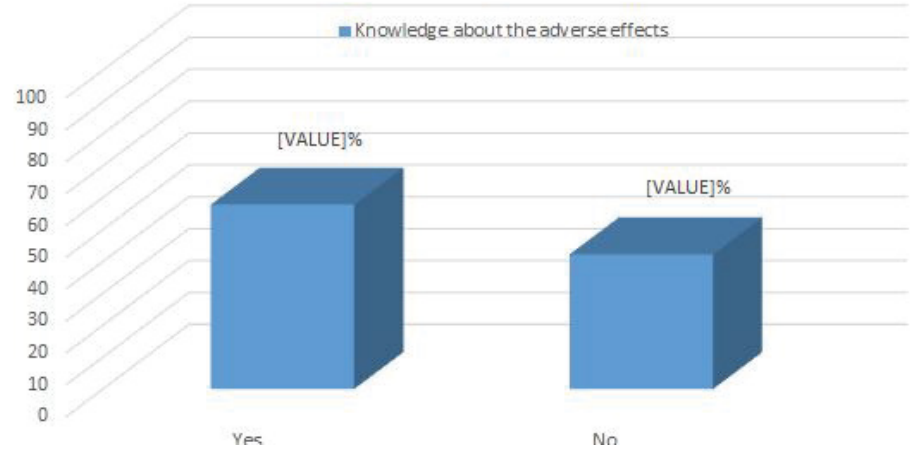

Figure 3 Knowledge about the adverse effects

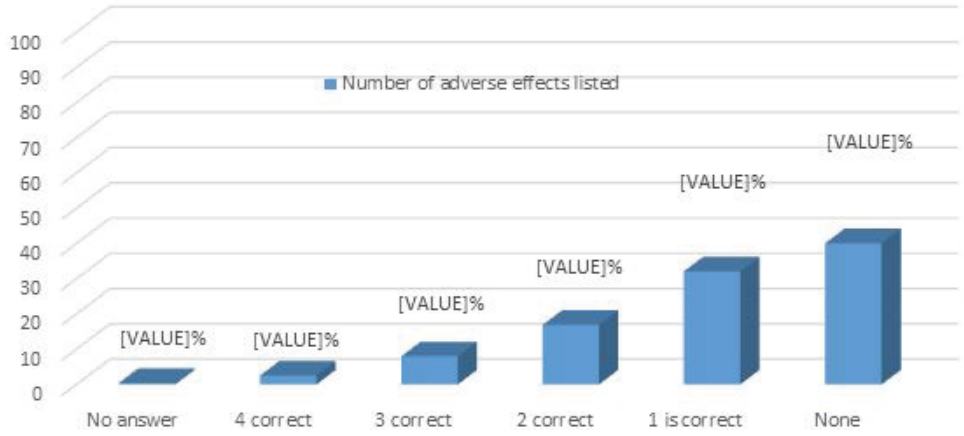

Figure 4 Number of adverse effects listed

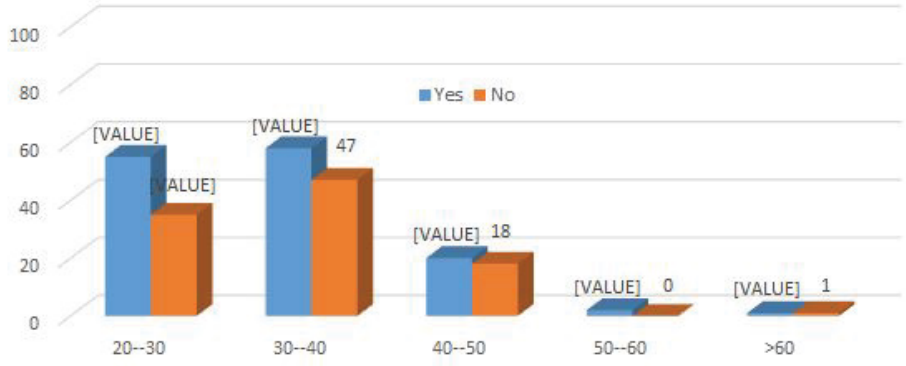

Figure 5 Knowledge about the adverse effects among different age groups

Knowledge about some of the Aspects of IPV

Doctors were asked about some aspects of IPV in order to figure out the awareness of this newly introduced vaccine among doctors.

The dosage schedule was asked: About 16.88% of the doctors couldn't answer to this question, 21.10% answering to this question as "exclusively", 26.16% of the doctors answered as a booster and 35.86% answered as "both". The correct answer to this is "both" (Figure 6).

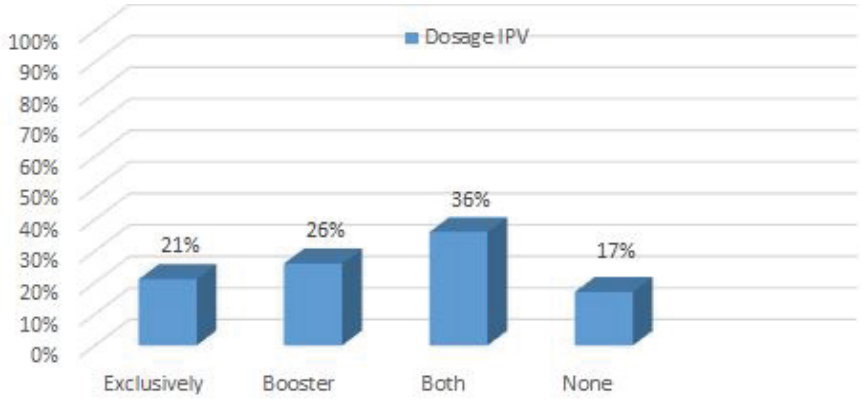

Figure 6 What is the dosage schedule of IPV?

Knowledge about the handling and storage of IPV: The doctors were asked about their knowledge about the handling and storage of IPV. Only 7.6% of the doctors knew about the handling and storage of IPV. About 3.8% of the doctors did not answer and 88.6% of the doctors said that IPV does require cold chain storage (Figure 7).

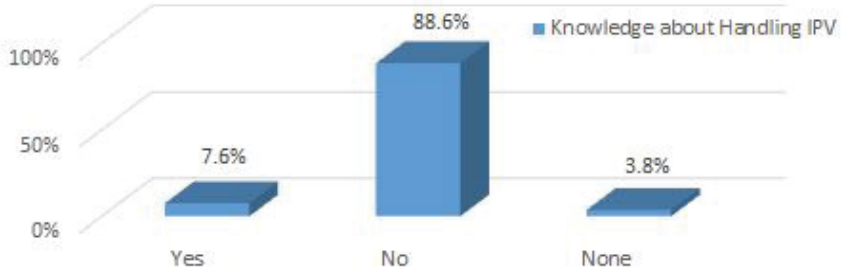

Figure 7 Knowledge about handling and storage of IPV

Knowledge about the requirement of specially trained staff: About 56.5 % of the doctors said "yes" while 40.9% said "no" and 2.5% did not answer the question (Figure 8).

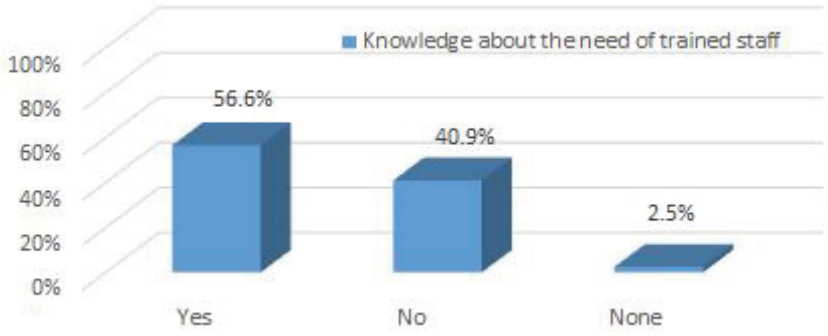

Figure 8 Knowledge about the requirement of specially trained staff

Knowledge about vaccine-associated paralytic poliomyelitis: About 56.54% of the doctors knew the answer to this question, whereas 43.46% of the doctors gave a negative answer (Figure 9).

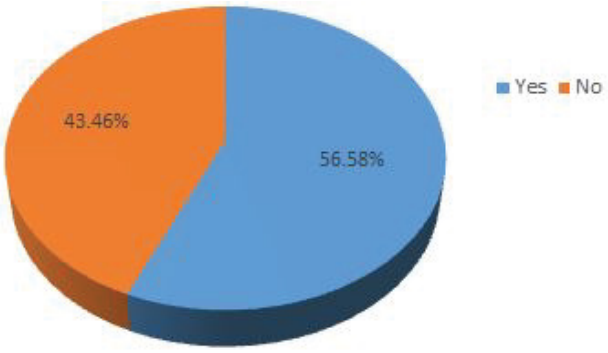

Figure 9 Knowledge about vaccine-associated paralytic poliomyelitis

Comparison of the Preference of Vaccine among Doctors and Patients

The results have shown that 220/237 (92.83%) of the doctors preferring OPV, and 225/237 (94.94%) of the doctors also confirmed that parents preferred OPV rather than IPV (Figure 10).

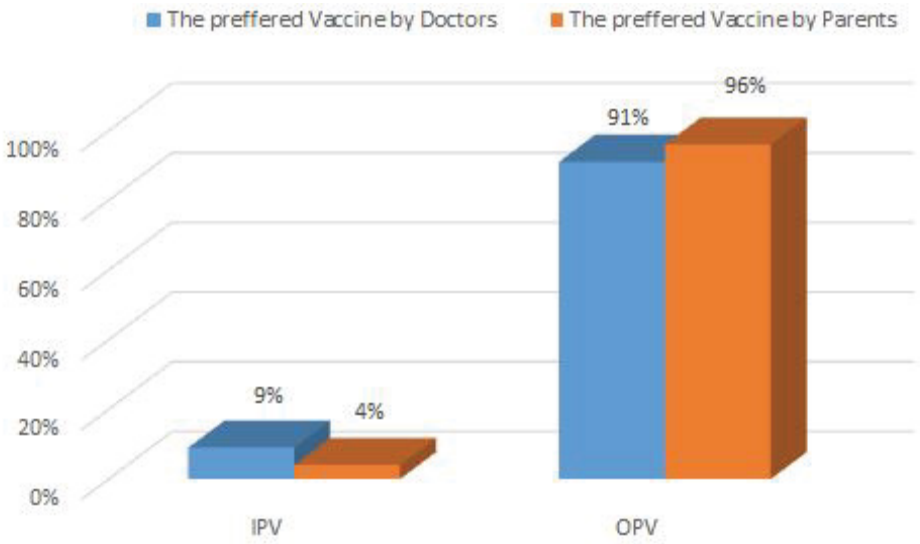

Figure 10 The preference of IPV and OPV by parents

Perception of the Doctors Regarding the Eradication of Polio by 2016

The results have shown that 21.52% of the patients answered “yes” and 78.48% answered “no” (Figure 11).

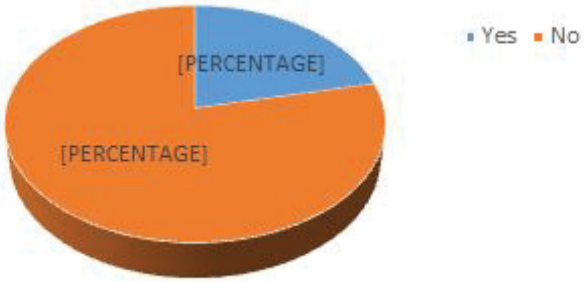

Figure 11 Perception of doctors regarding eradication until 2016

Knowledge about the Latest Program to Eradicate Polio

About 25.32% of the doctors said "yes" whereas 74.68% of the doctors did not know much about the eradication programs. Among the doctors who knew about the eradication program, an important proportion of 80% turned out to be young doctors (Figure 12).

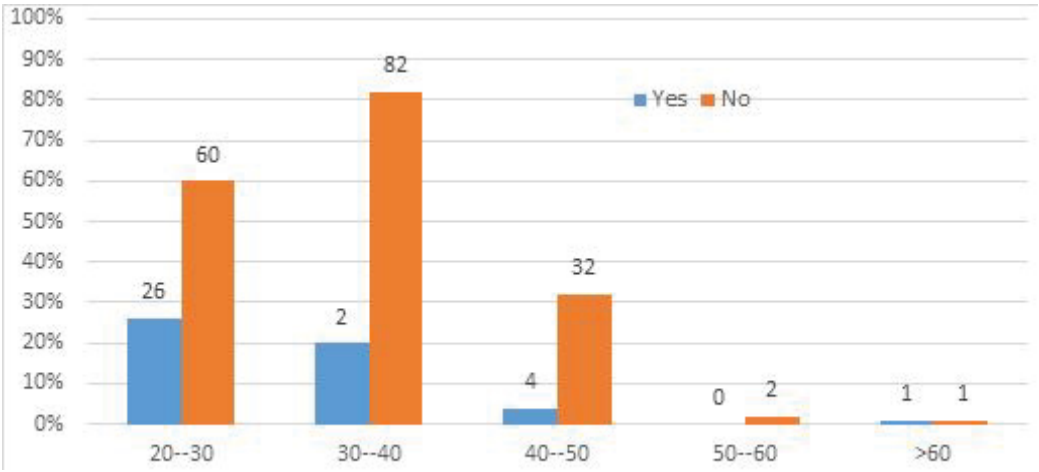

Figure 12 Knowledge about the latest program to eradicate polio

The Level of Awareness of Doctors

About 46% of the doctors were unaware of the new vaccine and its aspects as they answered less than 8 questions correctly. About 46% of the doctors were partially aware of the new vaccine and its aspects as they answered 8-13 questions correctly. Only 8% of the doctors were fully aware of the new vaccine and its aspects as they answered more than 13 questions correctly (Figure 13).

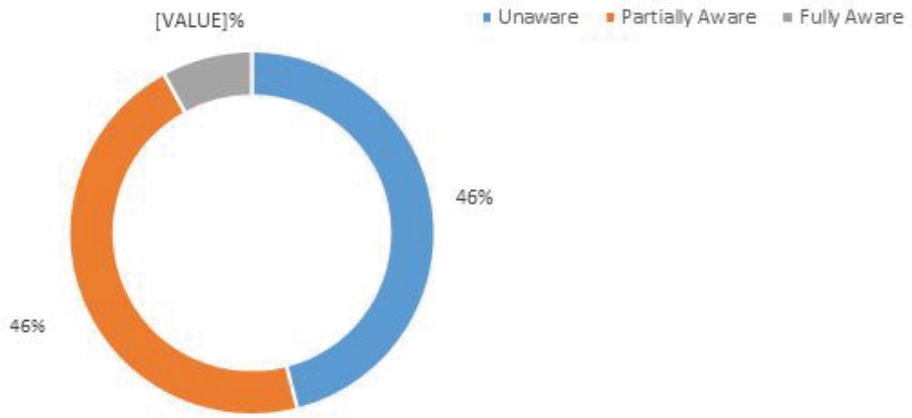

Figure 13 Awareness level of doctors regarding IPV

DISCUSSION

In our research, perception, and awareness of IPV was checked among the doctors of government hospitals of Abbottabad. Awareness was initially expected to be nil in accordance with the null hypothesis of our study, but after conducting a survey, the results were different.

Our actual study sample size was 250 but 237 doctors responded (the response rate of 94.8%). In our cross-sectional survey doctors were asked about polio infection and available vaccine options. Results showed that most of our doctors are well aware of polio disease and its prevalence in Pakistan and had awareness about its current vaccination schedule. The latest program for polio eradication was known to 22% of the doctors. End-polio End Game Strategic Plan 2013-2018 is the latest program whereas the National Emergency Action Plan was also considered correct. We

found the doctors were not aware of most of the IPV's aspects like its merits and demerits as compared to OPV. According to our statistics, only 7.6% of doctors (210/237) knew that IPV doesn't require extensive cold chain maintenance that leads to failure of OPV failures as an effective vaccine. Need for special training programs for staff, administering IPV was only known by 56.5% (134/237) of the doctors. This aspect was considered in our study because availability and experience of staff are important for parents regarding their approval for immunization. It is consistent with previous studies where parents hesitate because they doubt availability of trained staff [15]. OPV had VAPP risk, whereas, with its minimum temporary side effects of injection, nausea, fever, joint pain IPV became new accepted option by WHO and several developed countries of the world. Especially pain is the main concerning factor for parental disapproval of IPV. In several past studies parents were ready to pay to prevent pain [16-18]. This aspect was known by 57.8% (137/237) of doctors. Doctors have time and again influenced parent's decision about immunizations as is seen in previous works.

In one of the previous researches it was seen that parents accepted vaccines despite the inadequacy of their knowledge, only based on physician's recommendations. This led our research to be focused on the doctor's perception. Conforming to previous researches [19], our research also showed strong association between parents and doctors preference i.e. OPV preference by parents and doctors was 92.83% and 94.93% respectively.

When asked about the opinion on the possibility of polio eradication by end of 2016, the response was negative from 78.48% of the doctors. According to findings of study OPV preference was mainly due to lack of IPV vaccination information, like lack of knowledge that VAPP is not caused by IPV, which was one of the major side effects of OPV (1 in 24 million cases), lack of awareness of the fact that tiresome cold chain storage that was previously not been maintained and led to OPV ineffectiveness was not required for IPV. Not having awareness workshops on IPV and thus 59.5% (141/237) replied in negative when asked whether they know IPV.

Pain at site of the shot was known by 36% of the doctors. Thus side effects also caused reluctance in IPV use as even seen in previous study that parents were even ready to pay to prevent their child from suffering pain. They doubt availability of specially trained staff that is also in accordance with past researches.

Though OPV preference found in our study is not in accordance with past researches as reviewed literature favors circumventing OPV by global introduction of IPV [20]. The most important factor for this seems to be partial awareness among doctors as was previously seen that slight education intervention in parents caused marked increase in vaccination acceptance. And this educational intervention needs to be done by doctors. One of the inspiring and motivational results of our research is that young generation was comparatively more aware of latest program i.e. NEAP and End Polio End Game strategic program, (the age group 20-35 years) this gives us hope that our future generation knows about latest interventions of polio eradication programs so they can respond to parent's queries and can motivate them and increase efficiency of IPV introduction in KPK.

It is concluded that none of the factors can individually influence IPV approval. Competency of vaccinators, parental belief and availability of alternatives increases vaccine acceptance as seen in one of the researches carried out in 1990 [21-23]. Based on our survey, the need of the hour is to have re-orientation exercises. Practitioners should be given awareness of latest polio reduction program via health workshops and surveys. They should be well informed about IPV, its need and service availability. The practitioners can not only educate their patients about IPV's merits and demerits and thus reduce asymmetry of health education made available to parents but also supervised staff administrating it.

CONCLUSION

We concluded that many doctors were aware of polio infection and many of them knew about vaccine types currently being used for its eradication but only a few knew about merits and demerits of IPV over OPV. Doctors and parents preferred OPV. A lot more awareness of IPV needs to be created among doctors for effective administration of IPV. This will take time, money and combined efforts on part of many. But these doctors' awareness programs are sure to increase parents' consent on IPV and help Pakistan in eradicating polio.

Recommendations

- EPI schedule changes to be advertised and masses including doctors to be made well aware about it

- Seminars, lectures, workshops to be arranged on IPV where the rationale of IPV introduction to be made clear and merits and demerits of IPV to be discussed
- Special training of staff to be done as one of OPV preference cause is that doctors and parents fear injection site reaction and pain in infants
- Doctors should be kept in confidence whenever introducing a new vaccine as they can guide their patients more effectively and also supervise the staff administering it
- Provision of adequate amount of IPV and syringes to be supplied by the government

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