

KNOWLEDGE & PRACTICES OF CHILDHOOD IMMUNIZATION AMONG PRIMARY HEALTH CARE PROVIDERS IN RIYADH CITY: PART II - PRECAUTIONS AND CONTRAINDICATIONS TO VACCINATION

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هدف الدراسة: تقدير مستوى معرفة العاملين الصحيين بمراكز الرعاية الأولية للحقائق المتعلقة بتطعيمات الأطفال من حيث الاحتياطات والموانع ومستوى صحة التطبيقات المتعلقة بتطعيمات الأطفال وتطبيقها مع الأصول المعتبرة فيما يخص الاحتياطات والموانع وعلاقة ذلك بسنوات الخبرة ومستوى التدريب العاملين الصحيين. طريقة الدراسة: تم توزيع استبيان يشمل ست عشرة عبارة حول الاحتياطات الواجب اتخاذها وموانع التطعيم على العاملين الصحيين في خمسين مركزاً للرعاية الصحية الأولية في مدينة الرياض. نتائج الدراسة: أمكن تحصيل 506 استمارة استبيان إلا أن 331 منها فقط كانت مكتملة فيما يخص هذا الجزء من البحث فتكون نسبة المشاركة حوالي 65%. بينت الدراسة أن معرفة وممارسة العاملين الصحيين فيما يتعلق باحتياطات وموانع التطعيم في الجملة تتفق مع الأصول المعروفة رغم وجود بعض النقص في بعض الجوانب الهامة. الخلاصة والتوصيات: على الرغم من محدودية هذه الدراسة إلا أنه يمكن استخلاص أن معرفة وممارسة العاملين الصحيين فيما يخص احتياطات وموانع التطعيمات في المراكز الصحية بمدينة الرياض جيدة في الجملة لكنها لا تخلو من نقص في بعض الجوانب المهمة، كما أن هناك حاجة ماسة لمزيد من التدريب والتعليم المستمر والمتخصص في مجال التطعيمات لجميع العاملين الصحيين في مراكز الرعاية الصحية الأولية.

الكلمات المرجعية: تطعيمات الأطفال، المعرفة والممارسات، الاحتياطات والموانع، العاملين الصحيين في مراكز الرعاية الصحية الأولية.

Objectives: To assess 1) how aware those who administer vaccines in the primary health care centres (PHCs) are of the appropriate precautions and contraindications of vaccines and 2) the extent to which their practice complies with standards, and 3) the correlation between the levels of knowledge and practice on one hand with the duration of practice and attendance at a training course on vaccination on the other hand, for physicians and nurses separately.

Methods: A self-administered questionnaire including 16 statements related to knowledge and practice of precautions and contraindications of vaccines was distributed among workers in 50 MOH PHCs in Riyadh.

Results: 506 questionnaires were returned, only 331 were completed for this part of the study giving a response rate of almost 65%. However, the statement-specific response rate varied. Except for a few, most statements were correctly responded to by a majority of the respondents reflecting adequate knowledge and appropriate practice. Experience in dealing with vaccination, and formal training in vaccination were not statistically significantly associated with the responses of both physicians and nurses.

Conclusion: In spite of the limitations of this study it could be fairly concluded that the overall knowledge and practices regarding precautions and contraindications of childhood immunizations among the primary care providers surveyed was good. Significant gaps still exist. This underlines the need for continuous training and supervision of health care providers who deal with the immunization of children.

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INTRODUCTION

Vaccination has proved to be one of the most cost-effective part of health promotion.¹ The WHO estimates that current immunization programs save more than 3.2 million lives each year and the full utilization of existing vaccines could save an additional 1.7 million lives per year.² Through its expanded program on immunization (EPI) which was launched in 1974 and "Health for All" by the year 2000 programme, the WHO has significantly contributed towards the increased levels of immunization coverage in many parts of the world.³

Despite these impressive advances, some three million children still die each year from vaccine-preventable diseases and another three million are permanently disabled.^{2,4}

Since 1984, the EPI has been implemented in the kingdom as an essential and integral element of primary health care.⁵ Saudi Arabia is one of the developing countries that accelerated its immunization programme to reach full coverage by 1990.

Over the last twenty years, reports from the Kingdom have correlated the marked decline in the incidence of vaccine-preventable diseases with high rates of immunization coverage among infants and preschool children in most parts of the kingdom.

At the present time, more than 90% of school age children are completely immunized and the incidence rates of vaccine-preventable diseases has decreased by more than 90% from peak levels.⁶

Other factors like improvements in the socio-economic status of the population and better education have certainly played an important role in this decline.

In addition to tight legislations and public health education which have helped to maintain a high rate of immunization uptake, a high level of knowledge and appropriate standards of immunization practices among health care providers must be sustained to achieve a high level of vaccine coverage, uptake and seroconversion.^{1,5,8}

This paper describes the second part of a larger project which was carried out to assess how much those who administer vaccines in the primary health care centres of the Ministry of

Health in Riyadh were aware of the proper handling, administration, and scheduling, in addition to the necessary precautions and contraindications of vaccines, to determine the extent to which their practices and knowledge met the agreed standards. It was also to determine whether the duration of experience or attendance at a training course on vaccinations had any significant effect on the knowledge and practice of immunization. The entire original questionnaire comprised 50 statements; 16 of which related to this report. The first part of this study dealt mainly with handling, scheduling and the administration of vaccines.⁹ This second report was devoted mainly to knowledge and practice of precautions and contraindications to vaccination.

METHODS

A self-administered questionnaire in Arabic and English consisting of 16 statements related to knowledge and practice of precautions and contraindications regarding the nine vaccines included in the Kingdom Vaccination Schedule (MMR, DPT, BCG, OPV, & HBV) was distributed among 50 out of 59 Ministry of Health (MOH) Primary Health Care Centres in Riyadh City, directly by the investigator. The study was conducted just before the addition of Haemophilus Influenzae vaccine to the National Vaccination Schedule. The questionnaire was piloted on a sample of twenty nurses and physicians dealing with vaccination, before the final approval. The study was explained in detail to the most senior worker(s) available at each center at the time of distribution and queries were answered. It was stressed to all health care providers that giving sincere responses to the questionnaire was necessary for a realistic reflection of the actual knowledge and practice of the responders.

The data was entered in MS Excel and analyzed using the SPSS Pc+ statistical software. The descriptive statistics (proportions) were calculated for the positive responses of all outcome variables. Further, all the responses (correct / incorrect) of physicians and nurses were used to work out the association with their experience in dealing with vaccination (<5 years / >5 years) and formal training on vaccination (yes / no). Chi-square test was used to find out the statistical association between two categorical

variables. A p-value of <0.05 was considered as statistically significant.

RESULTS

Analysed for this part of the study were 331 questionnaires. 149 (45%) were completed by physicians, and 182 (55%) by nurses (including midwives).

Of those who completed the entire original questionnaire, 72.9% of the physicians and 39.2% of the nurses indicated that they had worked in the field of vaccination for more than 3 years; and 46.8% of the physicians and 77.7% of the nurses indicated that they had attended at least one training course on vaccine practices in the course of their work in the Kingdom.

The questionnaire had 16 statements designed to reveal the level of practice and knowledge of the precautions and contraindications to vaccination. The first four statements which concerned the practice of possible precautions or contraindications to vaccination are listed in Table 1. It can be seen clearly that for most of these items, a considerable percentage of respondents were lax in getting some information before vaccinating children.

Table 2 lists twelve statements reflecting knowledge of possible precautions and contraindications to vaccination. The correct response was given by more than 60% of the respondents for nine out of the twelve statements. Statement number 3 on vaccinating children with egg allergy scored the lowest percentage of correct response (10.3% for physicians and 11.8 for nurses). Less than 50% of respondents gave the correct response for statement numbers 5 & 10 on vaccinating children with mild fever and

children with controlled epilepsy. Except for the question which dealt with asking patients about previous vaccine reactions before giving the next vaccine which showed a positive correlation with increasing experience in dealing with vaccines ($p=0.026$), no statistically significant association was found between the correct responses of both physicians and nurses with their experience in dealing with vaccination nor with having attended a formal training course on vaccination.

DISCUSSION

It has been established that timely vaccination protects children from an early age and prevents disease outbreaks.¹⁰ In the developed countries, investigators have concluded that the primary cause for epidemics of vaccine preventable diseases was failure to provide vaccines on schedule.¹⁰ Delayed immunization schedule is partly due to ineffective provider practices which lead to missed opportunities for vaccination.¹¹ Conventional wisdom holds that missed opportunity for vaccination is the single most important cause of low vaccination levels. Missed opportunities are caused by less than optimal provider immunization practices, such as deferring immunizations for invalid reasons.¹² Missed opportunities may result in delayed vaccination, underimmunization and inadequate protection against preventable disease. Missed opportunities may be attributable to deficiencies in the provider's knowledge of the immunization schedule and true vaccine contraindications or overcautious interpretation of the contraindications. Minor illness although not a true contraindication often is associated with missed opportunities.¹³ Missed opportunities also

Table 1: Practice of data regarding possible precautions or contraindications to vaccination

Statement	Physicians			Nurses		
	Always*	Sometimes	Never	Always*	Sometimes	Never
1. Before vaccination I ask the parents of children about previous vaccine or reactions.	81.7% (121/148)	14.1% (21/148)	4.0% (61/148)	77% (140/182)	17.5% (32/182)	5.5% (10/182)
2. Before vaccination I ask the parents of children about presence of an immunocompromised individual in the household.	57.8% (85/147)	26.5% (39/147)	15.6% (23/147)	37.8% (67/177)	36.1% (64/177)	26.0% (46/177)
3. Before vaccination I ask the parents of children about history of blood transfusion or administration of blood products in the last few weeks.	46.2% (68/147)	26.5% (39/147)	27.2% (40/147)	28.5% (51/179)	33.5% (60/179)	38.0% (68/179)
4. Before vaccination, I ask the parents of children about current use of immunosuppressive medications in the child.	68% (98/144)	21.5% (31/144)	10.4% (15/144)	47.2% (85/180)	25.0% (45/180)	27.7% (50/180)

*Correct practice - Always/everytime

Table 2: Knowledge of possible precautions and contraindications to vaccinations

Statement	Correct Answer	Correct response	
		Physicians	Nurses
1. Injectable vaccines should not be administered to children with acute diarrhea	False	70.3% (102/145)	71.7% (127/177)
2. Family history of convulsions is a contraindication to DTP vaccinations	False	61% (85/139)	69.1% (119/172)
3. Necessary precautions should be taken before giving MMR vaccine to children with severe allergy to eggs.	False	10.3% (15/145)	11.8% (21/177)
4. Vaccination of children having colds and cough should be deferred until full recovery.	False	80.5% (120/149)	74.1% (132/178)
5. Children with oral temperature $\geq 38^{\circ}\text{C}$ should not be vaccinated.	False	48.2% (71/147)	68.1% (122/179)
6. OPV & MMR should not be given to children with primary immune deficiency disease	True	90.7% (127/140)	81.0% (128/158)
7. Children who suffered inconsolable crying for more than 3 hours after previous full DTP dose should be given half of the usual DTP dose.	False	92.6% (113/122)	92.8% (143/154)
8. Vaccinated is contraindicated in children who suffer longstanding respiratory, cardiovascular or liver diseases.	False	86.9% (120/138)	86.4% (140/162)
9. Children who come in contact with a child who got measles should not receive measles vaccination.	False	82.9% (117/141)	86.2% (144/167)
10. Children with controlled epilepsy should not receive the DTP vaccination	False	44.5% (61/137)	40.0% (68/170)
11. Soreness redness or swelling following an injectable vaccine contraindicates the use of such a vaccine.	False	86.7% (124/143)	84.5% (153/181)
12. Severe anaphylactic reaction to a vaccine contraindicates further doses of that vaccine.	True	95.6% (131/137)	87% (147/169)

exist when inappropriate contraindications are used to deny vaccination to children in need. General practitioners and pediatricians may have doubts about the real contraindications to primary vaccinations.¹⁴ Taylor et al found that accepting fewer contraindications to vaccinations from paediatricians in office-based practice is associated with higher practice immunization rates and vice versa.¹⁵ Zimmerman et al has pointed out that children are vaccinated later in the practices of providers who overinterpret contraindications.¹⁶ Hutchins et al interviewed ten health care providers and found that five had missed at least one opportunity to administer the measles vaccine because of a minor illness that was not a contraindication to vaccination.¹⁷ From New Zealand, Essex et al reported that 25.2% of the children studied had fallen behind the immunization schedule by the age of six months and that the most common reason for delaying immunization was that the baby was sick. This was a false contraindication in 69.2, 79 and 78.4% of these children at the six weeks, three months, and five months immunizations, respectively.¹⁸ Nirupam S et al's observations from India revealed that in 59.1% children, opportunity to vaccinate was missed. Only 3% children had a true contraindication for vaccination.¹⁹ False

contraindications to vaccinations are becoming an increasing obstacle to immunization both in the United States and in other countries.²⁰ Unfortunately, several mythical contraindications have sprung up over the years and these have prevented some children from being immunized.²¹ Many parents shared these myths with doctors and nurses in a subtle conspiracy against immunization.²⁰

Al Shehri et al from Riyadh surveyed 383 children below five years of age and found that 22.2% were delayed, 10.2% were classified as having genuine contraindications and 12% were missed opportunities to immunize. The rate of missed opportunities was higher among younger children than older ones; the reasons given by staff interviewed including mild upper respiratory tract infections, cough, diarrhea, and weight loss.⁵ Hasanain et al had reported from Jeddah, Saudi Arabia that 9% of the primary vaccines were not given on time. In 20%, the reason for the delay was a non-febrile upper respiratory tract illness. Only in 15% of infants was the delay based on physician's advice, and only 10% had a real contraindication.¹⁴ This suggests that to reach and sustain a high level of vaccination coverage, efforts must be made to reduce missed opportunities for vaccination. There should be

accurate screening at all visits and adherence to the contraindication guidelines, procedures considered provider-based, low-cost methods to increase immunization coverage.²² Necessary also are education and feedback to vaccine providers as well as regular updates and reviews of true and false contraindication for immunization, and the development of clinic guidelines on appropriate reasons to withhold immunization.¹³

In their report of 1991 National Immunization Coverage Survey in the Kingdom, M.K. Farag, et al, had found that the percentage of children partially immunized was considerably high (14%). This was partly due to the failure of health workers to pay proper attention to the time schedule of immunization. This underlines the provision and maintenance of basic and refresher training programmes for both medical and paramedical personnel. In addition, much more attention should be paid to the quality of immunization activities in primary health care settings.²³ In our study, almost 35% of the respondents said they had no previous training in immunization. This underscores the need for training of health care providers who deal with children's immunization as pointed out by health care authorities throughout the world.¹

Potential limitations of this study include: 1) More than 30% non-response rate; it is of course impossible to know the extent to which the nonrespondents differ with regard to their knowledge, attitudes and practices concerning childhood immunizations; 2) the self-report format of the study. However, in spite of the limitations of studies based on self-administered questionnaires, sometimes it is the only means of gathering objective information. Generalizations from our study are obviously limited to the survey's target population: primary care providers who see moderate to large numbers of preschool children.

CONCLUSION

It is concluded from the study that the knowledge of the health care providers at the primary health care centres in Riyadh City on precautions and contraindications of vaccines is fairly good, and their reported practice is mostly on compliance with the current immunization recommendations. However, there are still some gaps in knowledge as well as non-compliance in some practices.

From this study, it may not be easy to extrapolate how much this practice may have

contributed to the present level of immunization coverage.

The training received by a majority is apparently not adequate. This underscores the need for more efficient training and continuous education of primary health care providers working in the field of immunization.

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