

Perception of general pediatricians in Riyadh towards vaccination of patients with congenital heart diseases

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ABSTRACT

Background: Congenital heart defect (CHD) children are often predisposed to numerous conditions ranging from arrhythmias, infections, to heart failure. Proper implementation of vaccination plan and multidisciplinary acts are mandatory for maintaining such cases to reduce the mortality and morbidity. Furthermore, CHD are also at risk of vaccine adverse reaction and several blood-disseminated pathogens infections, and at risk of death if such events were to occur. Perception and Interpretation of the knowledge and experience of general pediatricians towards vaccination of patients with congenital heart diseases is a crucial element to understand, and to improve healthcare practice in Riyadh, Saudi Arabia. **Aims:** To clarify, our aim is to investigate views of different pediatricians in vaccination plans, to perceive junior and senior pediatricians, and to identify extra vaccines given to children with a congenital heart defect. **Settings and Design:** This study is a cross-sectional study that includes the distribution of 246 questionnaires through personal interview focusing on pediatric cardiologists and general pediatricians with varying years of practice and degrees. Study was conducted by six medical interns: Mohammed O. Alfakhri, Meshal F. Alhajji, Abdulrahman M. Alyani, Yahya Z. Murad, Abdulrahman E. Alghannam, Alwaleed H. Alqahtani, in six different tertiary hospitals, King Abdulaziz Medical City (KAMC), King Fahad Medical City (KFMC), King Faisal Specialist Hospital (KFSH), King Salman Hospital, and Alyamamah Hospital, in Riyadh, Saudi Arabia. **Methods and Material:** Data was collected through a convenient sampling technique and was analyzed using SPSS (version 20) and rearranged to observe the most frequent information obtained from the questionnaire. **Statistical Analysis Used:** Categorical study was described in frequencies and bar charts. Chi-Square test of significance was used after the data entry to assess the significance of the values obtained. **Results and Conclusions:** There was no significant difference between the six hospitals. In the following study, 81.7% of the participants believe that patients with congenital heart diseases are combined immunodeficient, and 84.6% agreed on giving special/extra vaccine with no preference over live and/or killed vaccine. On top of that, participants believe that the extra vaccines given to congenital heart disease patients with combined immunodeficiency are meningococcal and pneumococcal vaccines, and the special vaccine given to them are respiratory syncytial virus (RSV) and influenza vaccine. To conclude, congenitally heart defect children are widespread worldwide. Children suffering from the disease are having a serious problem that affects their lives from its earliest. For that, our research mainly focuses on improving their lives by trying to reduce the effect of several other preventable diseases using vaccines as and when they need. Several other studies believed in giving extra/special vaccines that vary depending on the location of the study. However, in Riyadh, we found that most pediatricians agree on giving extra vaccines as meningococcal and pneumococcal, and RSV and influenza as special vaccines to children with congenital heart defects.

Keywords: Children, congenital heart disease, pediatricians, vaccination

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Introduction

Vaccination plans have always been the same, except varied depending on the country's own exposure. However, children born with certain

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conditions also receive the same vaccination plans, but some doctors do prefer a certain plan over another, or they do give any extra vaccines that might aid in preventing diseases affecting such patients who are more susceptible?

Our research question is to have a thorough idea about the perception of general pediatricians in Riyadh towards vaccination of children with congenital heart disease. It is crucial to percept the general pediatricians if they agree on the specified plan or have an addition to it in patients with congenital heart defects.

The hypothesis for the research is to have a specific vaccination plan for patients with congenital heart disease, which includes some extra and special vaccines.

Background

Heart is the circulatory organ of the body that conveys blood through vessels to all different parts of the body. Chambers of the heart consists of remnants of the fetal circulatory system, for instance, foramen ovale. Foramen ovale is an opening in the wall between the right and left atria through which the blood travels into the left atrium. The existence of foramen ovale is due to fetus' lungs being filled with fluid, high pressure is exerted on the arteries, which force the blood to flow through the foramen ovale to the left atrium.^[1]

Abnormal formation or immaturity of any remnant structures of the heart has a direct lead to birth defects known as congenital heart diseases (CHDs). CHDs are classified into cyanotic and acyanotic.^[2] Tricuspid atresia is an example of a cyanotic CHD characterized by the absence of the tricuspid valve, which blocks the blood flow from the right atrium to the ventricle.^[2] An example of acyanotic CHD is the atrial septal defect, which is opened into the remnant of foramen ovale, causing the blood to flow between the atria.^[2]

Vaccination is dispensing an immune inducer, antigen, to certain diseases to develop a protective capability. On first normal exposure, the body tends to save an antibody specific to a certain disease for a faster response and resolution if an individual is on a second exposure. Vaccines function on a similar mechanism. Vaccines are categorized into two groups: the first group, live attenuated, and the second group includes subunit and Toxoid vaccines.^[3] The life-attenuated vaccines are enfeebled pathogens that induce a normal development of immunity to a disease, for example, smallpox and mumps. While the second group consists of a variety of classes. One of which is the Toxoid vaccines, which are inactivated toxins that are produced by the pathogen.^[3]

Several reactions such as the anaphylactic reaction may occur in vaccination whether an individual is healthy or has congenital heart defect (which rarely occurs on all age groups) that led to the death of a 2-month-old infant.^[4,5] Even delayed (late) vaccinations are potentially fatal for individuals younger than 2 years suggested in a study with 70% consensus of French vaccine experts.^[6] Children

with congenital heart defects often recover easily from illnesses as other children with a healthy heart, but most individuals with heart defects are susceptible to several blood-disseminated pathogens.^[7] In this research, we are seeking for individuals' opinion on whether they are using special vaccines or not. Do pediatricians consider a different vaccination regimen for the children with congenital heart defects? The main of this study is to have a comprehensive idea about the perception of general pediatricians in Riyadh towards vaccinations of children with congenital heart defects, to identify vaccination regimens, to compare different pediatricians views on vaccination plan, and to determine the regular vaccination plan.

Methodology

Study area and setting

This is a cross-sectional study that included the distribution of three hundred questionnaires to general pediatricians through a personal interview in six hospitals in Riyadh in a convenient sampling technique. Two hundred forty-six questionnaires were obtained and analyzed by using Statistical Package for the Social Sciences (SPSS) and rearranged to observe the most frequent information obtained from the questionnaire.

The study was directed in Riyadh. The six hospitals were: King Abdulaziz Medical City, King Fahad Medical City, King Faisal Specialist Hospital, King Saud medical city, King Salman Hospital, and Alyamamah Hospital.

The number of questionnaires obtained from each hospital is shown below:

1. For King Abdulaziz Medical City there were 62 participants, which equals to 25.2% of all participants.
2. For King Saud medical city there were 45 participants, which equals to 18.3% of all participants.
3. For King Fahad Medical City there were 43 participants, which equals to 17.5% of all participants.
4. For King Faisal Specialist Hospital there were 40 participants, which equals to 16.3% of all participants.
5. For King Salman Hospital there were 7 participants, which equals to 2.8% of all participants.
6. For Alyamamah Hospital there were 49 participants, which equals to 19.9% of all participants.

Sampling technique

The sampling technique used was convenience sampling. Targeting differently general pediatricians including consultants, associate consultants, fellows, and residents. The mean of the years of practice for all participants was 6.69.

The qualifications of the participants are shown below:

One-hundred and thirty participants were board-certified, which equals to 52.8%, 17 were PHDs and equals to 6.9%, and 99 participants with others in a different category, which includes MBBS and equals to 40.2%.

Data collection

In this study, data were obtained through the distribution of questionnaires by six medical students through a personal interview to conveniently sampled pediatricians in six different hospitals. The distribution went successfully except for some hospitals and individuals with the refusal of some consultants to cooperate in participating. Also, the distribution of the questionnaires in some hospitals required a difficult process to conduct the research in their facilities. The total number of pediatricians in Riyadh was enough to conduct the research but not optimum to reach our satisfactory number, which was 300. In the questionnaire, they were generally asked about their perception of vaccination of patients with congenital heart diseases, emphasizing on whether they give regular or special vaccines.

Data management method

The obtained information was analyzed using SPSS. Nineteen questions were described in frequencies and table charts. One way analysis of variance (ANOVA) test was used to obtain the *P* value. Approval was obtained from the ethical committee on 13 November 2016.

Results

A questionnaire was distributed to 246 doctors in King Abdulaziz Medical City, King Fahad Medical City, King Faisal Specialist Hospital, King Saud medical city, King Salman Hospital, and Alyamamah Hospital, in Riyadh.

In the questionnaire, there were significant results after data collection and analysis in all six hospitals. It was found that there was no significant difference between hospitals (*P*-value = 0.286) indicating 76.4% of the participants have patients with congenital heart defects [Table 1].

The first question was about the hospital they worked in and was mentioned in the methodology [Table 2a]. We also asked about the gender of the participant and they were 141 male participants who resemble 57.3% of the population, and the female participants were 105 which is equal to 42.7% of the population [Table 2b].

Furthermore, a question was about the number of years of practice to evaluate experience of our patients. The mean of years among the 246 participants was 6.6951, and the standard deviation was 6.84050 [Table 3].

Another question was asked about the qualification of the participants and it was mentioned in detail in the methodology [Table 4]. We also asked if our participants had patients with congenital heart diseases, 188 of them answered yes, which equals to 76.4%, those who did not have patients with congenital heart diseases are 58, which equals to 23.6% [Table 1]. In the next question, 226 answered yes to whether or not they see patients with congenital heart disease in disregard

Table 1: The rate of pediatricians who have CHD patients

	Frequency	Percent
Yes	188	76.4
No	58	23.6
Total	246	100.0

Table 2a: The number of participants per hospital

	Frequency	Percent
1	62	25.2
2	45	18.3
3	43	17.5
4	40	16.3
5	7	2.8
6	49	19.9
Total	246	100.0

Table 2b: The rate and percentage of male and female participants

	Frequency	Percent
Male	141	57.3
Female	105	42.7
Total	246	100.0

Table 3: The mean of years of experience among the participants

<i>n</i>	Mean	Std. Deviation
246	6.6951	6.84050

Table 4: Degree and qualifications of the participants

Qualification	Frequency	Percent
Board	130	52.8
Diploma	20	8.1
PHD	17	6.9
Other	79	32.1

of why they see those patients, and 20 answered No to that question [Table 5]. The question after that was given to see if our population tend to vaccinate their CHD patients regardless of the type of vaccine, 194 answered Yes, which equals to 78.9% and 52 answered No, which equals to 21.1% [Table 6]. We also included a question inquired about if they think CHD patients are immunocompetent, immunodeficient, or if they don't know. One hundred and sixty-two participants chose immunocompetent, which equals to 65.4%, 54 participants chose immunodeficient, which equals to 22%, and 31 chose "I don't know", which equals to 12.6% [Table 7a]. In the next question, participants who answered "immunodeficient" were asked about the type of the immunodeficiency, in their opinion. A total of 81.7% said it is combined immunodeficiency, 7.3% said it is cellular immunodeficiency, and 11% said it is humoral immunodeficiency [Table 7b].

Table 5: The answers of participants to whether or not they see patients with CHD

		Frequency						Percent
Yes		226						91.9%
No		20						8.1%
Total		246						100.0
Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	61	41	38	38	6	42	226
	Percent	27.0%	18.1%	16.8%	16.8%	2.7%	18.6%	100.0%
No	Frequency	1	4	5	2	1	7	20
	Percent	5.0%	20.0%	25.0%	10.0%	5.0%	35.0%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Table 6: The answers of participants to whether or not they tend to vaccinate their CHD patients

		Frequency						Percent
Yes		194						78.9
No		52						21.1
Total		246						100.0
Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	57	30	36	31	4	36	194
	Percent	29.4%	15.5%	18.6%	16.0%	2.1%	18.6%	100.0%
No	Frequency	5	15	7	9	3	13	52
	Percent	9.6%	28.8%	13.5%	17.3%	5.8%	25.0%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Are there any special vaccines? The results showed that 208 of 246 participants give extra vaccines, while the remaining 38 do not. [Table 8] Our questionnaire results also showed that 30.9% of the participants give live vaccines, 38% give killed vaccines, and 31.1% are not certain about whether to give live or killed vaccines to children with CHD [Table 9].

Furthermore, 50.4% (124 participants) give RSV vaccine as an extra vaccine, while 49.6% (122 participants) do not. The one-way ANOVA test for the previous question shows that the *P* value is 0.316 and it is equal to higher than the level of significance ($\alpha = 0.05$) and thus accept the null hypothesis and reject the alternative hypothesis, meaning that there is no significant difference in the level of hospitals and the answer of the viewers of the question [Table 10].

Another question was asked to throw light on the influenza vaccine as an extra vaccine. A percentage of 69.1% of our population give influenza vaccines as an extra vaccine, whereas 30.9% do not. The one-way ANOVA test shows a *P* value of 0.244 [Table 11]. Moreover, meningococcal vaccine is given by 74.4% of the participants [Table 12a]. In addition, pneumococcal vaccine was given as an extra vaccine by 198 of 246 participants [Table 12b]. However, a majority of 160 participants do not give rota vaccine as an extra vaccine [Table 13]. Do pediatricians give oral polio vaccine (OPV) and inactivated polio (IPV)? The results showed that 25.2% give IPV, and 17.5%

give OPV. A percentage of 40.7% give both, and 15.4% of the pediatricians give neither [Table 14].

Discussion

As written in a research that was conducted in Seoul, Korea, Severance Cardiovascular Hospital, CHD in pediatrics is one of the major risk factors in severe lower respiratory infection. Also, it was mentioned that hospitalization might be required, not to mention the probability of treatment in an intensive care unit along with the utilization of mechanical ventilator support are recognized to increase. Thus, preventing RSV infection in CHD is a must.^[8] Therefore, giving RSV vaccine to children with congenital heart defect is nearly mandatory due to its significant effect on their outcome.

As pre-mentioned in our research, RSV was widely mentioned between doctors in different hospitals with no significant level of difference compared to few other studies that also mentioned RSV infections as common lower respiratory tract infections in patients who were susceptible such as children with congenital heart defect. Moreover, immune prophylaxis use was successfully introduced and it was beneficial as preventive treatment and reduction of the burden of RSV.^[9]

Another study in England showed the severity of RSV infection in CHD children in a more significant way than normal children. The study included a population of 699 hospitalized infants, which was attempted in a period between 1976 and 1980 in winter seasons. Two hundred and twenty-nine had acquired RSV infection during admission or before, a total of 73 infants had congenital heart defects, 27 of them were infected with RSV, and 46 were not infected. The mortality rate was higher in infants with congenital heart disease, which is 37% compared to the other infants which was 6.5% and a *P* value of less than 0.01. From this study, we concluded that it also showed the importance of dispensing RSV as a special vaccine to infants with congenital heart defects.^[10]

In a study conducted in China, it was estimated that the incidence of CHD at birth was about 0.8%. About a quarter of children born with CHD. Many vaccines in China, such as BCG, JEV-L, MCV 4, and MPV-A, “heart disease” are clearly classified as a

Table 7a: Opinions of participants about the immunological status of their CHD patients

	Frequency	Percent
Immunocompetent	162	65.4
Immunodeficient	54	22.0
I don't know	31	12.6
Total	246	100.0

Hospitals		1	2	3	4	5	6	Total
Cellular immunodeficiency Immunodeficient	Frequency	41	32	25	25	4	35	162
	Percent	25.3%	19.8%	15.4%	15.4%	2.5%	21.6%	100.0%
I don't know Cellular immunodeficiency	Frequency	10	8	10	14	3	9	54
	Percent	18.5%	14.8%	18.5%	25.9%	5.6%	16.7%	100.0%
Immunodeficient	Frequency	11	5	8	1	0	5	30
	Percent	36.7%	16.7%	26.7%	3.3%	0.0%	16.7%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Table 7b: The type of suggested immunodeficiency for those who believe their CHD patients are “immunodeficient”

	Frequency	Percent
Cellular immunodeficiency	18	7.3
Humoral immunodeficiency	27	11.0
Combined immunodeficiency	201	81.7
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Cellular immunodeficiency	Frequency	4	3	4	4	1	2	18
	Percent	22.2%	16.7%	22.2%	22.2%	5.6%	11.1%	100.0%
Humoral immunodeficiency	Frequency	3	6	1	4	5	8	27
	Percent	11.1%	22.2%	3.7%	14.8%	18.5%	29.6%	100.0%
Combined immunodeficiency	Frequency	55	36	38	32	1	39	201
	Percent	27.4	17.9	18.9	15.9	0.5	19.4	100.0
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Table 8: Answers to weather of not to give extra vaccination to their HD patients

	Frequency	Percent
Yes	208	84.6
No	38	15.4
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	58	32	41	35	4	38	208
	Percent	27.9%	15.4%	19.7%	16.8%	1.9%	18.3%	100.0%
No	Frequency	4	13	2	5	3	11	38
	Percent	10.5%	34.2%	5.3%	13.2%	7.9%	28.9%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

contraindication in the instructions. However, the definition of “heart disease” is unclear, which made many providers hesitate to give vaccines to children who suffer from CHD. However, the mechanism of the effect of CHD on vaccination remains up until now unclear. In some developed countries, specialists even consider children with CHD as the priority population for vaccination.^[11]

Furthermore, pneumococcal vaccine (PCV) was found to reduce the risk of all-cause of pneumonia in CHD children. A study was conducted in 2017 that included 348 patients with congenital heart defects, 196 of them were dispensed with 1 or 2 doses of PCV and 152 were unvaccinated. The relative risk reduction was 60.5% while the absolute reduction was 20% and it was found that at least two doses of PCV were needed to reduce such risk.^[12]

The adoption of haemophilus influenza type B (Hib) has also been proven to reduce the mortality and morbidity of patients with congenital heart defects in a study that was conducted in Philadelphia in 2011. In our study, it was found that 170 participants which correspond to 69.1% of the participants agreed on using influenza vaccine, yet the type of influenza was not mentioned.^[13]

There was a study published by the American Academy of Pediatrics, which suggested that preventing, detecting, and controlling infections in children with congenital heart diseases are the key functions of a primary care provider. Therefore, primary

Table 9: The rate of answers to the type of vaccine that participants give to their CHD patients

	Frequency	Percent
Live	76	30.9
Killed	94	38.0
I don't know	77	31.1
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Live	Frequency	15	18	12	10	5	16	76
	Percent	19.7%	23.7%	15.8%	13.2%	6.6%	21.1%	100.0%
Killed	Frequency	30	13	17	19	1	14	94
	Percent	31.9%	13.8%	18.1%	20.2%	1.1%	14.9%	100.0%
I don't Know	Frequency	17	14	14	11	1	19	77
	Percent	22.1	18.2	18.2	14.3	1.3	24.7%	100.0

Table 10: Answers to Whether or not To give RSV vaccine to CHD patients

	Frequency	Percent
Yes	124	50.4
No	122	49.6
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	31	23	15	27	2	26	124
	Percent	25.0%	18.5%	12.1%	21.8%	1.6%	21.0%	100.0%
No	Frequency	31	22	28	13	5	23	122
	Percent	25.4%	18.0%	23.0%	10.7%	4.1%	18.9%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent							

ANOVA (For table 10)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.714	5	0.343	1.187	0.316
Within Groups	69.295	240	0.289		
Total	71.008	245			

ANOVA: Analysis of variance

Table 11: Answers to Whether or not To give influenza vaccine to CHD patients

	Frequency	Percent
Yes	170	69.1
No	76	30.9
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	48	29	30	25	5	33	170
	Percent	28.2%	17.1%	17.6%	14.7%	2.9%	19.4%	100.0%
No	Frequency	14	16	13	15	2	16	76
	Percent	18.4%	21.1%	17.1%	19.7%	2.6%	21.1%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

ANOVA (For Table 11)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.156	2	4.578	1.420	0.244
Within Groups	780.411	242	3.225		
Total	789.567	244			

ANOVA: Analysis of variance

Table 12a: Answers to Whether or not To give meningococcal vaccine to CHD patients

	Frequency	Percent
Yes	183	74.4
No	63	25.6
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	50	33	33	29	5	33	183
	Percent	27.3%	18.0%	18.0%	15.8%	2.7%	18.0%	100.0%
No	Frequency	12	12	10	11	2	16	63
	Percent	19.0%	19.0%	15.9%	17.5%	3.2%	25.4%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Table 12b: Answers to Whether or not To give pneumococcal vaccine to CHD patients

	Frequency	Percent
Yes	198	80.5
No	48	19.5
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	57	27	39	36	3	36	198
	Percent	28.8%	13.6%	19.7%	18.2%	1.5%	18.2%	100.0%
No	Frequency	5	18	4	4	4	13	48
	Percent	10.4%	37.5%	8.3%	8.3%	8.3%	27.1%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Table 13: Answers to Whether or not To give Rota vaccine to CHD patients

	Frequency	Percent
Yes	86	35.0
No	160	65.0
Total	246	100

Hospitals		1	2	3	4	5	6	Total
Yes	Frequency	21	17	14	17	0	17	86
	Percent	24.4%	19.8%	16.3%	19.8%	0.0%	19.8%	100.0%
No	Frequency	41	28	29	23	7	32	160
	Percent	25.6%	17.5%	18.1%	14.4%	4.4%	20.0%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

care providers might have the need to re-evaluate their national vaccination schedule before administering them to CHD patients, not to mention that giving seasonal flu and pertussis vaccines to CHD patients relatives might prevent serious complications as well. However, the need for consultations with infectious disease specialists and immunologists is still significant.^[14] Thus, it is safe to say that primary care providers have an important role in the management of immunization in stable CHD patients.

Table 14: Answers to whether or not to give IPV, OPV, neither or both vaccines to CHD patients

		Frequency						Percent
IPV		62						25.2
OPV		43						17.6
Neither		38						15.4
Both		103						41.8

Hospitals		1	2	3	4	5	6	Total
IPV	Frequency	19	10	13	13	0	7	62
	Percent	30.6%	16.1%	21.0%	21.0%	0.0%	11.3%	100.0%
OPV	Frequency	3	14	8	7	3	8	43
	Percent	7.0%	32.6%	18.6%	16.3%	7.0%	18.6%	100.0%
Neither	Frequency	8	9	3	4	2	12	38
	Percent	21.0%	23.6%	7.9%	10.5%	5.2%	31.5%	100.0%
Both	Frequency	32	12	19	16	2	22	103
	Percent	31.0%	11.6%	18.4%	15.5%	1.9%	21.3%	100.0%
Total	Frequency	62	45	43	40	7	49	246
	Percent	25.2%	18.3%	17.5%	16.3%	2.8%	19.9%	100.0%

Difficulties were experienced in data collection in King Faisal Specialist Hospital and King Fahad Medical city, due to a prolonged waiting time for a questionnaire warrant and acceptance from departments of pediatrics of both hospitals, and few uncooperative doctors, which caused the delay of the research progress.

Finally, our main objective was to identify the general perception of general pediatricians in Riyadh towards vaccination of children with congenital heart disease, we found out that most of them agree to give meningococcal vaccine, RSV, PCV, and Hib as an extra dose of vaccine to CHD patients.

Conclusion and Recommendations

There was no significant difference in the findings between the six hospitals. A total of 81.7% of participants believe that patients with CHD are combined immunodeficient, and 84.6% of the participants agreed on giving special/extra vaccines with no preference over using live and/or killed vaccine to the patients. Most participants agreed on giving extra vaccines such as meningococcal, pneumococcal, and special vaccines such as RSV, influenza. Rota vaccine was agreed not to be given as a special/extra vaccine by most participants. Furthermore, we found that most participants give extra and special vaccines to CHD patients who are believed to be combined immunodeficient. We should give meningococcal and pneumococcal vaccines as an extra vaccine, and RSV and influenza as a special vaccine.

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Conflicts of interest

There are no conflicts of interest.

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