

Original Article

Effect of Maternal Vaccination on the Occurrence of Orofacial Cleft in Children

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ABSTRACT

An orofacial cleft is one of the major genetic disorders in children that can occur due to various malpractices and negligence by mothers during the gestational period towards factors crucial for giving birth to a healthy infant. One of these factors includes incomplete vaccination during pregnancy which can lead to the malformation of the oral cavity. Children with orofacial cleft suffer from multiple problems, especially in eating and encounter a slow growth rate along with the inability to perform competently in doing physical activity and other social aspects.

Objective: To evaluate the effect of vaccination on the occurrence of an orofacial cleft in children. **Methods:** A sample of 100 children aged between 1-12 years using non-probability sampling was selected from 2 hospitals in Lahore, Pakistan. A pre-tested questionnaire was used to gather information and data was analyzed by using SPSS version 21.0. **Results:** Mothers of 60% of children suffering from orofacial cleft did not get vaccinated during pregnancy whereas more than 50% of affected children were having slow growth according to their age along with facing problems in eating and normal food intake. **Conclusion:** The effect of maternal vaccination on the occurrence of an orofacial cleft in children is quite clear. Orofacial cleft also significantly affects the lives of children by declining their growth and overall personal and social life activities.

INTRODUCTION

Cleft lip and cleft palate (CLP), also known as orofacial cleft, is a multidisorder condition involving cleft lip (CL), cleft palate (CP), or both of these conditions together. A cleft lip contains an opening in the upper lip that may extend into the nose. A CP is when the roof of the mouth contains an opening into the nose [1]. The average prevalence rate of an orofacial cleft in the United States is 7.75%. The states of the US with the highest and lowest prevalence rates are Maryland (21.46%) and West Virginia (2.59%), respectively. Countries with the highest and lowest occurrence are Japan (19.05) and South Africa (3.13), respectively. Globally, the prevalence rate of CL has declined, with an average overall prevalence of 7.94% [2]. CLP is suggested to be familial, involving mutated genes running throughout families, along with environmental factors. The Diet and nutrition of the mother during pregnancy as well as the medication she uses has an important role in this regard [3,4]. With regard to OCs, maternal exposure to tobacco and alcohol use, metabolic status (diabetes, obesity or low weight), viral infection, medicinal drugs (anticonvulsants) and teratogens (solvents, agricultural chemicals), as well as the preventive role of immunization during pregnancy, vitamin supplements, have been investigated [5-7]. The role of vaccination during pregnancy is of great importance. Since 2004, it has been ruled by the Advisory Committee on Immunization Practices that women who will be pregnant during the influenza season receive the inactivated influenza vaccine (IIV) in any trimester of pregnancy. Commonly, Inactivated Influenza Vaccine is explicitly recommended during the first trimester, a period of fetal organogenesis, continued monitoring of birth outcomes after maternal vaccination showed that women who did not get the complete vaccination gave birth to babies with orofacial clefts [8,9]. Existing data

on maternal Inactivated Influenza Vaccine and [birth defects](#) are not sufficient due to multiple definitions of birth defect outcomes and more work needs to be done [10]. Children with CLP/ICP had impaired W/A and BMI growth with spontaneous recovery starting early in childhood [11,12]. Children with CLP face feeding problems which starts at birth and continues later in life [13,14]. Hence, there is dire need to devise appropriate methods for feeding these children according to the type of impairment they have [15-18]. Children with OC also suffer from growth retardation due to insufficient diet and nutritional intake. The attendance of affected children in schools is also compromised affecting their overall learning and social growth [19, 20]. This study aims to assess the effect of maternal vaccination on the occurrence of orofacial clefts and how orofacial clefts in children can affect their growth and different activities of life. The study emphasizes creating awareness through extensive health education for improving the balanced diet of children if needed for the improvement of their proper development. As if these children will not be addressed well on time the quality of life among children suffering from cleft lip or palate will be decreased.

METHODS

A cross-sectional study was carried out at 2 different hospitals in Lahore, for a period of 4 months. A sample of 100 participants aged between 1-12 years was selected through non-probability convenient sampling and data was collected through pre-tested questionnaire. The gathered information was analyzed and assessed with the help of SPSS version 21.0.

RESULTS

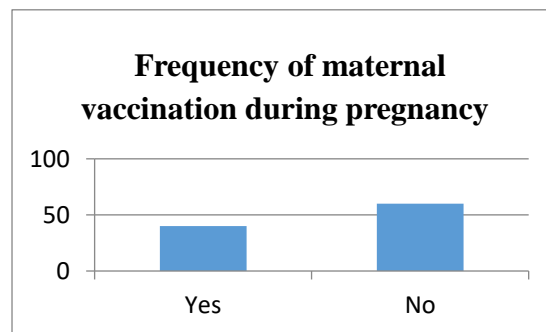


Figure 1: Frequency distribution of maternal vaccination during pregnancy

The figure 1 shows that only 40% mothers received complete vaccination during pregnancy while 60% did not complete their vaccination and gave birth to babies with orofacial cleft.

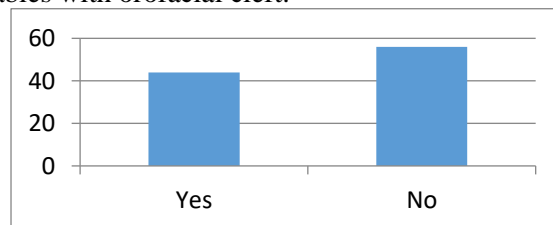


Figure 2: Frequency distribution of children with orofacial cleft gaining weight normally according to age

Figure 2 shows that 44% parents agreed that their baby was gaining normal weight according to his/her age, where as 56% parents told that their baby was not gaining normal weight according to his/her age. Table 2 shows that 47% children with orofacial cleft had normal increase in height whereas a greater percentage (53%) had short height according to their age.

Children with orofacial cleft having a normal increase in height	Frequency
Yes	47%
No	53%
Total	100%

Table 2: Frequency distribution of the children with orofacial cleft having a normal increase in height

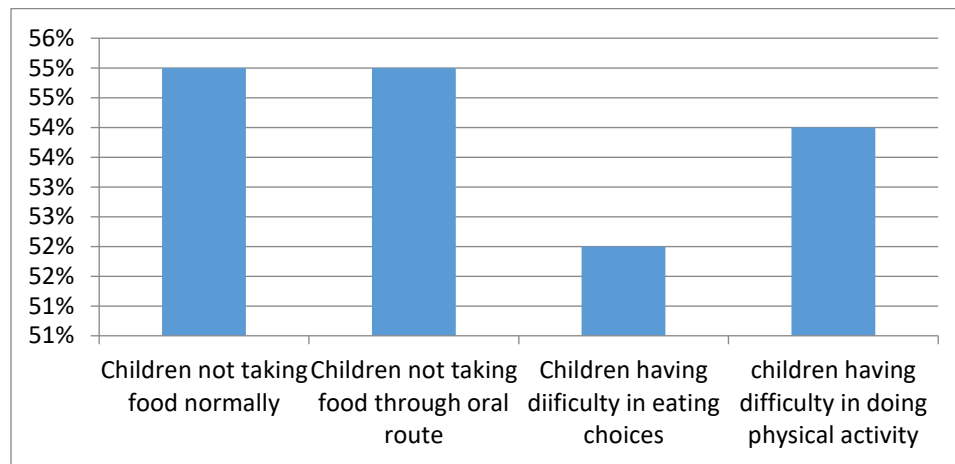


Figure 3: Frequency distribution of difficulty in eating and physical activity

Figure 3 shows that more than 50% children out of 100% were suffering from difficulty in choosing food, eating food, having normal food intake orally and difficulty in performing physical activities.

DISCUSSION

The present puts light on the fact that mothers who completed their vaccination course during pregnancy had a lower rate of incidence of children with orofacial clefts as compared to ones who did not get their vaccination completely done. The same hypothesis was proven by a research carried out by Källén B and Olausson PO in 2012 [21]. A study conducted by de Vries IA, Breugem CC *et al* in 2014 showed that children with orofacial clefts had a slow growth rate as compared to normal healthy children. The current study also directs towards similar findings showing statistics indicating a decreased growth in weight and height according to age [22]. In 2016 a systematic review conducted by Duarte GA, Ramos RB *et al* thoroughly reviewed the effects of orofacial clefts on the eating patterns, eating difficulties, difficulty in making good food choices and overall ability to perform physical activity. All these factors were elevated in children with orofacial clefts making it difficult for them to have a healthy food intake and perform physical activities normally. Similar findings were obtained the current research [23]. Maternal vaccination during pregnancy has a considerable effect on the occurrence of orofacial clefts in children. Mothers who got completely vaccinated during the gestational period had reduced chances of having children with orofacial clefts. However, mothers who did not pay attention towards complete vaccination had increased incidence of infants with orofacial clefts.

CONCLUSION

Children suffering from cleft lip and cleft palate are unable to grow to their full potential. Along with retarded growth another major problem encountered by suffering children is the inability to take food orally and normally resulting in decreased food intake and malnourishment.

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