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Research Article

PREVALENCE AND DISTRIBUTION OF TRAUMATIC DENTAL INJURIES IN IVF CHILDREN OF WEST BENGAL

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ABSTRACT

Context: Traumatic dental injury is one of the detrimental injuries faced by paediatric population. It has short or long lasting after effect on developing dentition and surrounding perioral structure. The prevalence and severity of traumatic dental injuries among in vitro fertilization (IVF) children of West Bengal is not documented till date.

Aims: The aim of this study is to evaluate the prevalence of traumatic dental injury among IVF children of West Bengal evaluated through Ellis and Davey's (1960) criteria.

Settings and Design: In a cross-sectional case control study, a total of 239 teeth of 158 IVF children (aged 6 month to 14 years) seen from 2009 to 2011 were surveyed, comprising of both traumatized primary and permanent teeth. A total of 947 teeth of 763 spontaneously conceived children (aged 6 month to 14 years) comprising of both traumatized primary and permanent teeth were kept as control fulfilling the inclusion and exclusion criteria.

Methods and Material: The information of the samples was collected using a predesigned data sheet by a single examiner using WHO criteria and Ellis and Davey's (1960) classification. Case group consisted of term, singleton babies who were the outcome of IVF in the studied area in 2009-2011. The control group consisted of spontaneously conceived children of the same area.

Statistical analysis used: Statistical analysis was carried out using Z-test.

Results: No statistically significant difference found in studied (IVF children) and control group (spontaneously conceived children) except in 8 category like fall fight, TDI due to other causes group, in age wise division such as group I, II and III, as well as in class IX type of TDI and in permanent maxillary lateral incisor category, where the results are statistically significant at $P < 0.05$.

Conclusions: IVF children are considered nearly same as spontaneously conceived children when studied according to TDI except in 8 categories. So they may be treated in the same manner as like spontaneously conceived children with a little bit of more precaution because they are more precious to their parent.

INTRODUCTION

Infertile couples often take help of in-vitro Fertilization (IVF) process as one of the treatment modalities of infertility. Louise Brown, the world's first test tube baby on 25th July 1978 after in vitro fertilization and embryo transfer (IVF-ET) technique accomplished by R. G. Edwards and P. Steptoe in Oldham, (1978).[1] On the other hand world's 2nd test tube baby named Durga was born as a result of team work represented by Dr. Subhas Mukherjee and Dr. Saroj Bhattacharya in Kolkata, 3rd October, 1978 West Bengal, India.[2]

Purpose of this study was to find out the prevalence of traumatic dental injury in IVF children of west Bengal. Since, there has been no study on traumatic dental injuries of IVF children of the studied area it was decided to conduct a cross-sectional study in that area to investigate the prevalence and severity of traumatic dental injuries among IVF children of the studied area. Dental trauma causes very significant problem in both primary and permanent dentition.[3] Effect and frequencies of dental trauma may vary in different population. Different studies have reported different frequencies of TDI in different countries. Percentage of traumatic dental injuries has been ranging from 10.2 to 69.2%.[4-5,8-9] The most common age

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group in which TDI occurs is 1 to 3 years due poor motor coordination[6] and 8-12 years due to more sports related accidents.[6-7]

Subjects and Methods

A cross-sectional case control observational study was carried out among IVF children aged 6 months to 14 years seen in the period from 2009 to 20011 at West Bengal India. The study was approved by the ethical committee of Guru Nanak Institute o Dental Science and Research. The sample comprised a total of 158 IVF and763 spontaneously conceived children, 239 (n) and 947 traumatized teeth were used in the analysis respectively. The children could have more than one tooth affected by traumatic dental injury. TDI to the maxillary and mandibular primary and permanent teeth were recorded according to Ellis and Davey's (1960)[10] classification. The case group consisted of term (gestational age = 37-42 weeks), singleton babies who were outcomes of in-vitro fertilization of the studied area and were chosen by a computer generated random number list. The control group consisted of term, first child, singleton and spontaneously conceived 6 months to 14 years old children who were referred to the department of Pedodontics and preventive dentistry for the treatment of TDI. Case and control samples matched for the year of birth, area of residence, parity, gestational age, maternal weight, maternal age and socio-economic status. Neonatal medical records of the case and control groups were reviewed and variables such sex, gestational age, birth weight and length, route of delivery, maternal age and parity were recorded. Severe asphyxia, children with major congenital malformations, multiple pregnancies, chromosomal abnormalities and genetic syndromes were excluded from the sample. The specific study was conducted after informed consent was gathered from the concerned authorities and guardians of respective children. To obviate error due to inter observer variations all examinations were made by a single examiner who was trained to record the examination according to WHO[11] and also was not informed about the birth status of the children. Obtained data was statically analyzed. For comparison of proportions Z test was used.

RESULTS

A total of 239 traumatized teeth of IVF children and 947 teeth of spontaneously conceived children were included in the study. In case of traumatized deciduous teeth found in male the Z-Score is -0.4655. The p-value is 0.63836. The result is not significant at p <0.05. In case of traumatized teeth deciduous found in female the Z-Score is 0.4655. The p-value is 0.63836. The result is not significant at p <0.05. In case of traumatized permanent teeth found in male the Z-Score is -0.2807. The p-value is 0.77948. The result is not significant at p <0.05. In case of traumatized teeth permanent found in female the Z-Score is 0.2807. The p-value is 0.77948. The result is not significant at p <0.05. (Table 1) In case of causes of dental trauma in deciduous tooth due to falls in deciduous teeth the Z-Score is 0.2827. The p-value is 0.77948. The result is not significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to fights in deciduous teeth the Z-Score is 2.4317. The p-value is 0.0151. The result is significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to sports in deciduous teeth the Z-Score is -2.9376. The p-value is 0.00328. The result is significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to accidents in deciduous teeth the Z-Score is 0.0521. The p-value is 0.96012. The result is not significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to blunt object trauma in deciduous teeth the Z-Score is -1.0625. The p-value is 0.28914. The result is not significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to biting trauma in deciduous teeth the Z-Score is -0.4084. The p-value is 0.6818. The result is not significant at p <0.05. In case of causes of dental trauma in deciduous tooth due to other causes in deciduous teeth the Z-Score is 2.1632. The p-value is 0.03078. The result is significant at p <0.05. In case of causes of dental trauma in permanent tooth due to falls in permanent teeth the Z-Score is -2.8805. The p-value is 0.00398. The result is significant at p <0.05. In case of causes of dental trauma in permanent tooth due to fights in permanent teeth the Z-Score is 3.2441. The p-value is 0.0012. The result is significant at p <0.05. In case of causes of dental trauma in permanent tooth due to sports in permanent teeth the Z-Score is -0.646. The p-value is 0.5157. The result is not significant at p <0.05. In case of causes of dental trauma due in permanent tooth to accidents in permanent teeth the he Z-Score is 0.2256. The p-value is 0.8181. The result is not significant at p <0.05. In case of causes of dental trauma in permanent tooth due to blunt object trauma in permanent teeth the Z-Score is -0.2886. The p-value is 0.77182. The result is not significant at p <0.05. In case of causes of dental trauma in permanent tooth due to biting trauma in permanent teeth the Z-Score is 0.2731. The p-value is 0.78716. The result is not significant at p <0.05. In case of causes of dental trauma in permanent tooth due to other causes in permanent teeth the Z-Score is 2.3779. The p-value is 0.01732. The result is significant at p <0.05. (Table 2) In case of causes of dental trauma in deciduous tooth in group I(1-5 Yrs.) the Z-Score is 3.8937. The p-value is 0.0001. The result is significant at p <0.05. In case of causes of dental trauma in deciduous tooth Group II (6-11 Yrs.) the Z-Score is -3.8937. The p-value is 0.0001. The result is significant at p <0.05. In case of causes of dental trauma in permanent tooth Group II (6-11 Yrs.) the Z-Score is 3.4216. The p-value is 0.00062. The result is significant at p <0.05. In case of causes of dental trauma in permanent tooth Group III (12-14 Yrs.) the Z-Score is 2.2563. The p-value is 0.02382. The result is significant at p <0.05. (Table 3) In case of dental trauma in permanent tooth in Class I type of injury the Z-Score is -1.5873. The p-value is 0.11184. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class II type of injury the Z-Score is 1.4674. The p-value is 0.14156. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class III type of injury the Z-score is 1.5604. The p-value is 0.11876. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class IV type of injury the Z-Score is -0.8834. The p-value is 0.37886. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class V type of injury the Z-score is -1.5646. The p-value is 0.11876. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class VI type of injury the Z-Score is 0.9321. The p-value is 0.35238. The result is not significant at

p <0.05. In case of dental trauma in permanent tooth in Class VII type of injury the Z-Score is 0.7051. The p-value is 0.4777. The result is not significant at p <0.05. In case of dental trauma in permanent tooth in Class VIII type of injury the Z-Score is -0.1684. The p-value is 0.86502. The result is not significant at p <0.05. In case of dental trauma in deciduous tooth in Class IX type of injury the Z-Score is NaN. The p-value is 0. The result is significant at p <0.05. (Table 4) In case of dental trauma of deciduous tooth in Maxillary central incisor category the Z-Score is 1.2609. The p-value is 0.20766. The result is not significant at p <0.05. In case of dental trauma of deciduous tooth in Maxillary lateral incisor category the Z-Score is 0.7361. The p-value is 0.4593. The result is not significant at p <0.05. In case of dental trauma of deciduous tooth in Maxillary canine category the Z-Score is -0.3267. The p-value is 0.7414. The result is not significant at p <0.05. In case of dental trauma of deciduous tooth in Mandibular central incisor category the Z-Score is -1.0302. The p-value is 0.30302. The result is not significant at p <0.05. In case of dental trauma of deciduous tooth in mandibular lateral incisor category the Z-Score is -0.952. The p-value is 0.34212. The result is not significant at p <0.05. In case of dental trauma of deciduous tooth in Mandibular canine category the Z-Score is -0.8827. The p-value is 0.37886. The result is not significant at p <0.05. I In case of dental trauma of deciduous tooth in multiple lesions category the Z-Score is -1.824. The p-value is 0.06876. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in Maxillary central incisor category the Z-Score is 1.8053. The p-value is 0.0703. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in Maxillary lateral incisor category the Z-Score is -2.7279. The p-value is 0.00634. The result is significant at p <0.05. In case of dental trauma of permanent tooth in Maxillary canine category e Z-Score is 0.3995. The p-value is 0.68916. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in Mandibular central incisor e Z-Score is 0.2956. The p-value is 0.76418. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in Mandibular lateral incisor category the Z-Score is 0.614. The p-value is 0.54186. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in Mandibular canine category the Z-Score is 0.2815. The p-value is 0.77948. The result is not significant at p <0.05. In case of dental trauma of permanent tooth in multiple lesions category the Z-Score is 0.296. The p-value is 0.76418. The result is not significant at p <0.05. (Table 5)

DISCUSSION

IVF children are likely to be one of the precious children parents ever have. Parents are much concerned on their beloved children in respect to physical, behavioral and developmental upbringing. This study had revealed that IVF children may be equally affected by TDI except some statistically significant variations. In case of causes of dental trauma in deciduous tooth due to fights in deciduous teeth, {in case of IVF 3.06% and spontaneously conceived children (SCC) 11.21%} the result is statistically significant. This kind of result is generated may be due to the over protection of the IVF children. In case of causes of dental trauma in deciduous tooth due to sports in deciduous teeth (IVF 25.51% and SCC 13.08%) the result is significant. Here the result is interesting. In this category the shows IVF children are more prone to sports related accident in deciduous teeth. So, more attention is needed at this age group of IVF children. In case of causes of dental trauma in deciduous tooth due to other causes in deciduous teeth (IVF 3.06% and SCC 9.97%) the result is significant. In case of causes of dental trauma in permanent tooth due to falls in permanent teeth (IVF 50.35% and SCC 37.22%) the result is significant. Here also the result is amazing. More care is needed to prevent injury due to fall is needed to IVF group of children. In case of causes of dental trauma in permanent tooth due to fights in permanent teeth (IVF 4.25% and SCC 14.21%) the result is significant. In case of causes of dental trauma in permanent tooth due to other causes in permanent teeth (IVF 0.709% and SCC 5.27%) the result is significant. The result shows that the parent of IVF children are more concerned to their beloved children. In case of causes of dental trauma in deciduous tooth in group I (1-5 Yrs.) the result is significant (IVF 47.95% and SCC 69.47%). In case of causes of dental trauma in deciduous tooth Group II (6-11 Yrs.) the result is significant (IVF 52.04% and SCC 30.52%) here also the result is interesting. Parents of IVF children should be more careful regarding their beloved at this age group. In case of causes of dental trauma in permanent tooth Group II (6-11 Yrs.) the result is significant (IVF 41.13% and SCC 57.02%). In case of causes of dental trauma in permanent tooth Group III (12-14 Yrs.) the result is significant (IVF 32.62% and SCC 42.97%). In case of dental trauma in deciduous tooth in Class IX type of injury the Z-Score is NaN. The p-value is 0. The result is significant. In case of dental trauma of permanent tooth in Maxillary lateral incisor category the result is statistically significant. These results reflect that the active care of IVF parents protect the children during their early and younger age. TDI has a physical, aesthetic and psychological impact both on the children and their parents. However, during the time of cause analysis it was observed that poor psychomotor development and poor motor skills in infant and toddlers were the main causative factors of TDI.[12-13-14] on the other hand fall ,fights and sports injuries were the other causative factors for TDI in 8-9 years aged children.[5-6] different studies had revealed that the maxillary central incisors followed by maxillary lateral incisors were the most frequently injured teeth in the primary and permanent dentition.[9,15-16] Unfortunately there was no available previous data available regarding the TDI of IVF children. So no comparison was possible in our study.

CONCLUSION

In this study statistically significant difference in TDI was observed between in-vitro fertilized and spontaneously conceived children in some specified arena. Our study reflects that in-vitro fertilized children are less suffering from TDI and the result is statistically significant. The present study had tried to find out through the obtained data, whether the in-vitro fertilized children were better than same group of spontaneously conceived children accidental care. This study is also significant from social perspective as it motivates the parents of in-vitro fertilized children in a positive manner.

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