A Comparative Prevalence Study of Oral Habit Status among IVF and Spontaneously Conceived Children of West Bengal

Objective  In-vitro fertilization is one of the modern treatments modality of infertility. Deleterious oral habits are the common problem often found by the dental surgeons during routine examination. Oral habits are repetitive behaviour in the oral cavity that exhibited in different ways like thumb sucking, lip sucking, nail biting, mouth breathing, tongue thrusting, handkerchief biting, etc. Development of oral habits may cause dentoalveolar and/or skeletal deformation in children and ultimately form, function, and aesthetics of orofacial region may be compromised.

Aims  The aim of the present study is to evaluate the oral habits status of in-vitro fertilized (IVF) children of West Bengal, India.

Settings and Design  In a cross-sectional case control study, oral habit status of children in the age group of 6–14 years was assessed. The case group comprised term, singleton babies who were the consequence of IVF in the studied area. The study period was 2009–11. The proposed control group consisted of term, first child, singleton, and spontaneously conceived 6–14 years old children who were also resident of the same studied area.

Materials and Methods  A sample of 150 IVF and 150 spontaneously conceived children were examined to find out their oral habit status.

Statistical Analysis Used  Using Z test.

Results  The results showed that the prevalence of oral habits in IVF children was 39.3%. Thumb sucking was relatively more common habit and seen in only 16.66% of IVF children. Nail biting was found in 11.33%, handkerchief biting in 3.33%, and the result was significant at p < 0.05. Tongue thrusting (6%) and mouth breathing (2%) cases was relatively less common of IVF children and the result is not significant at p < 0.05 level. Presence of handkerchief biting is a unique finding of the present study.

Conclusion  The deleterious oral habits restrict proper growth and development of orofacial structure of IVF children. So these kinds of habits should be interrupted and treated as early as possible.

KEYWORDS  IVF children, oral habits, thumb sucking, mouth breathing, prevalence, tongue thrusting, handkerchief biting

Key Messages  IVF children are more oral habit prone.

INTRODUCTION

A habit is a repetitive action being done automatically. Repetitive behaviours are common in infantile period and most of them start and finishes spontaneously. One of the most common repetitive behaviours in infantile period is hand sucking. The reflex of sucking appears around 29 weeks of age, which is one of the first sophisticated patterns of behaviour in infants. Hand sucking is naturally developed in 89% of infants in the second month and in 100% of them in the first year of age. After 3 years children leave their habit. If the habit persists, then the habit is known as persistent type of oral habit.

Infertility and its treatment have an immense impact on a person’s quality of life. Infertility problems are among the most upsetting experiences in peoples’ lives. In our country, where a stable family structure and desire for children are the norm; social and religious stigma are most of the time
associated with infertility. As a result of these two criteria, there is an ever-increasing demand for diagnosis and treatment of infertile couples.\(^4\)

The first test tube baby in the world, Louise Brown,\(^3\) was born on 25 July 1978 after in-vitro fertilization (IVF) technique, by R. G. Edwards and P. Steptoe in England.\(^3\) This revolutionary work was regarded as a landmark in the treatment of infertility. No study on prevalence of oral habit of IVF children of West Bengal has been found after intensive manual and electronic search of English language literature on dentistry. The present study was conducted to collect information regarding the oral habit status of IVF children of West Bengal, India.

**SUBJECTS AND METHODS**

The children in both case and control groups based on the route of pregnancy were enrolled for the present study. Total 759 parents of studied samples were selected to participate in the present study after confirming the ethical/legal aspects of the research. Out of the above total 150 IVF and 150 spontaneously conceived children’s guardian confirmed to participate in the present study. Oral habit can be influenced by many factors such as age of the child, order of child birth, socioeconomic status, number of siblings, working mother, social adjustment and stress, etc. So in the present study inclusion criteria were mid- to higher socioeconomic family background, working mother, and singleton child without any medical disability.

In the studied case group, i.e., IVF children group, singleton babies having gestational age of 37 to 42 weeks, who were outcome of IVF in Institute of Reproductive Medicine, West Bengal, were selected by a computer-generated random number list. The control group comprised term, first child, singleton, and spontaneously conceived 6–14-year-old children who were referred to Guru Nanak Institute of Dental Science and Research, West Bengal, for the primary dental health check-up purpose. Both case and control subjects were matched for area of residence, parity, gestational age, socioeconomic status, and year of birth. Medical records of both case and control groups were further reviewed and variables such as gestational age, route of delivery, sex, and parity were recorded. These were the main inclusion criteria of the study. Exclusion criteria for the present study were multiple pregnancies, severe asphyxia, children with major congenital malformations, chromosomal abnormalities, and genetic syndromes. Because IVF is a costly treatment module, all the studied samples were from mid and high socioeconomic condition. Communication was done with the help of address and contact number already given by the parents of the studied sample. This cross-sectional, prospective, descriptive, and observational study was conducted after individual consent was obtained from the respected authorities and the guardians of children. Above 300 children had fulfilled criteria of sample selection belonged to middle or high socio-economic group. Dependent variables were thumb sucking, mouth breathing, nail biting, and tongue thrusting. Other children selected for the study were allowed to sit comfortably on the dental chair. The children were accompanied by their parents or legal guardians during examinations. Detection of the various oral non-nutritive habits in the studied children was conducted in two stages. In the first visit, a questionnaire was given to the parent, and in the second visit a clinical assessment of the child was done. To eliminate error due to inter observer variations all examinations were performed by a trained single examiner who was not informed about the birth status of the children. When the parents’ information and the clinical diagnosis coincided positively, presence of non-nutritive habit was confirmed. Obtained data was then statistically analysed using z-test analysis. A z-test analysis is based on the z-statistic, which follows the standard normal distribution under the null hypothesis.

**RESULTS**

One hundred and fifty IVF children and 150 spontaneously conceived children were evaluated in the present study. Among 150 IVF children, 75 (50%) were male and 75 (50%) were female. Among spontaneously conceived children, 103 (68.7%) were male and 47 (31.3%) were female (Table 1).\(^3\) Sex-wise distribution of oral habit in IVF and spontaneously conceived children is depicted in Tables 2 and 3. In IVF children category, oral habit was found in 38.66% of male subjects but in case of female the percentage was 40.0%. So in our study, we found female were slightly more inclined towards oral habit (Table 2). When presence of oral habit in male is concerned the Z-score is 4.612. The p value is 0. The result is significant at \(p < 0.05\). When presence of oral habit in female is concerned the Z-score is 2.1439. The p-value is 0.03236. The result is significant at \(p < 0.05\) (Tables 2, 3). In case of oral habit is concerned, no habit is found in case of 91 cases of IVF

<table>
<thead>
<tr>
<th>Type of delivery</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVF children</td>
<td>75 (50%)</td>
<td>75 (50%)</td>
<td>150 (100%)</td>
</tr>
<tr>
<td>Spontaneously conceived children</td>
<td>103 (68.7%)</td>
<td>47 (31.3%)</td>
<td>150 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>178 (59.3%)</td>
<td>122 (40.7%)</td>
<td>300 (100%)</td>
</tr>
</tbody>
</table>
children whereas 130 cases were found in case of spontaneously conceived children. The Z-score is −5.1123. The p-value is 0. The result is significant at p < 0.05. Thumb sucking was present in 25 cases in IVF children whereas 6 cases was found in case of spontaneously conceived children. The Z-score is 3.6038 and p-value is 0.00032. The result is significant at p < 0.05. Tongue thrusting was present in 9 cases in IVF children whereas 8 cases was found in case of spontaneously conceived children. The Z-score is 0.2497. The p-value is 0.80258. The result is not significant at p < 0.05. Nail biting was present in 17 cases in IVF children whereas 8 cases was found in case of spontaneously conceived children. The Z-score is 3.2404. The p-value is 0.0012. The result is significant at p < 0.05. Handkerchief biting was present in 5 cases in IVF children whereas no cases of handkerchief biting (proportion is 0) was found in case of spontaneously conceived children. The Z-score is 2.2549. The p-value is 0.02444. The result is significant at p < 0.05. Mouth breathing was present in 3 cases in IVF children whereas 3 cases was found in case of spontaneously conceived children. The Z-score is 0 and p-value is 1. The result is not significant at p < 0.05 (Table 4 and Fig. 1).

DISCUSSION

Conception through IVF precisely differs from natural conception. The circumstances of in vitro fertilization, mechanical damage to the mother’s oocyte, first cell divisions outside the womb, less optimal transferring of embryo back into the patient’s uterus, etc. may be some causative factors which may influence the outcome of IVF. Several review studies had revealed that (singleton) IVF pregnancies had a worse perinatal outcome than spontaneously conceived singleton pregnancies.6,7 IVF children more often found born small for gestational age or preterm, because the developing foetus may be influenced by environmentally induced changes during fertilization. So, in this study, our objective is to find out the influence of IVF on oral habit development. Habit is defined as frequent or constant practice or acquired
tendency fixed by frequent repetition. Oral habits if they persist beyond the preschool age have been implicated as an important environmental etiological factor associated with the development of malocclusion. Psychological status of an individual also influences in development of oral habit. When the habit affect developing orofacial structure then it is known as deleterious oral habit. Oral habits may cause dentoalveolar and/or skeletal deformation in children. The amount of deformation is related to the frequency, duration, direction, and intensity of certain habits. Deformation may include anterior or posterior open bite, interference of normal tooth position, alteration of bone growth and cross bites, and changes in the eruption pattern of tooth. Bhayya\(^4\) found 38% children have oral habit. Present study has supported this finding. In our study, more number of IVF children displayed oral habits and the result is statistically significant ($Z$-score was $-5.1123$; p-value was 0. The result was significant at $p < 0.05$). In the present study, thumb sucking was also found to be significantly higher ($Z$-score was 3.6038; p-value was 0.00032. The result was significant at $p < 0.05$) level in IVF children but the result was slightly less significant than handkerchief biting ($Z$-score was 2.2549; p-value was 0.02444. The result was significant at $p < 0.05$). From the study it was observed that the incidence of tongue thrusting habit is higher in IVF children than spontaneously conceived children, which was not statistically significant ($p > 0.05$). In the present study, it revealed that handkerchief biting was present in IVF children in a significantly higher level ($p < 0.05$). This is a unique finding of the study. Onyeaso\(^5\) found digit sucking was most prevalent. Present study supported this finding also. In the present study, 39.3% child were found having oral habits and among them 16.66% were having thumb sucking habit which was most prevalent in nature. Nail biting was also found in more number of cases in IVF children as compared to spontaneously conceived children. This finding nearly supports the finding of Shetty and

### Table 4 Percentage distribution of oral habit in IVF children and spontaneously conceived children.

<table>
<thead>
<tr>
<th>Oral habit</th>
<th>IVF children</th>
<th>Spontaneously conceived children</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of cases</td>
<td>Percentage</td>
</tr>
<tr>
<td>No habit</td>
<td>91</td>
<td>60.7</td>
</tr>
<tr>
<td>Thumb sucking</td>
<td>25</td>
<td>16.66</td>
</tr>
<tr>
<td>Tongue thrusting</td>
<td>9</td>
<td>6.0</td>
</tr>
<tr>
<td>Nail biting</td>
<td>17</td>
<td>11.33</td>
</tr>
<tr>
<td>Handkerchief biting</td>
<td>5</td>
<td>3.33</td>
</tr>
<tr>
<td>Mouth breathing</td>
<td>3</td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

*Fig. 1 Oral Habit Found in IVF Children and Spontaneously Conceived Children.*
Munshi who found nail biting in 12.7% cases (in the present study it was found in 11.33% cases).

As no studies found in this field involved IVF children, no comparison was possible with that of previous study, so more studies are required in this untouched arena. Only peculiar thing observed in the present study was the occurrence of an uncommon habit in IVF children – handkerchief biting habit. The reason of development of this kind of habit may be that all the IVF children are from affluent families; their mothers are more concerned and conscious towards their precious child. Probably they provide handkerchief to their beloved babies at the time of going school. This is a good practice. But at the time of anxiety the offspring use these handkerchiefs as a stress releasing habit or otherwise as a pleasure habit. More studies are required to evaluate the relationship among socio-demographic status along with the oral habit development of this kind of artificially conceived children.

CONCLUSION

This study is the first of its kind in India to find out various oral habit statuses of IVF children and compare the data with spontaneously conceived children. The deleterious oral habits restrict proper growth and development of orofacial structure. So these kinds of habits should be treated accordingly. As IVF children are more precious to their parents more care and proper instructive guidance can help them to intercept deleterious oral habits. Regular check up by paediatric dental surgeon can be helpful in this matter. The dental surgeon can provide the patient and parent information regarding consequences of a habit and treatment modalities to control such habits.

REFERENCES