TRENDS OF SMOKING AMONG THE PARENTS OF CONGENITAL TALIPES EQUINOVARUS PATIENTS

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Abstract

Background: Congenital Talipes Equino-Varus is one of the deformities of the lower limb that is most prevalent among males. Many epidemiological studies are in progress/going on to know the exact cause, even though it is suggested that genetic and environmental factors (smoking) play central role in causing the disorder.

Objectives: To evaluate the trends of smoking, economic status, educational and ethnic background in parents of patients with Congenital Talipes Equino-Varus

Methodology: The study was a descriptive cross section survey carried out at PIPOS Rehabilitation Services Program (PRSP), Peshawar from April 2014 to May 2014. A self-structured questionnaire was used to collect data from participants. Only the patients with clubfoot were included in the study. The data was analyzed by using SPSS V20.

Results: Number of the participants included in the study were n=107 and Mean age was 8.22± 6.10 years. 70 (65 %) participants were having bilateral clubfeet and 37 (35%) were unilateral clubfeet. There was not even a single participant whose mother did smoke but there were 47 (44%) participants whose father used to smoke during pregnancy. 4 (4%) of participants were having household smoking and 56 (52%) participants' parents were not smoker. Data revealed that 69 (64%) of mothers were illiterate, 48 (48%) families of the participants were having average economic income, 81 (76%) of respondents were from rural area and 83 (78%) of respondent parents married within the family while 24 (22%) of respondent parents married outside the family.

Conclusion: This study clearly showed the trends of smoking among the family members of the clubfoot participants. Passive mother smoking, average income families, illiterate mothers and family marriages were common among clubfoot patients.

Key words: Club Foot; Maternal Smoking; foot deformities

Introduction

Various studies showed that one child out of every thousand is born with club foot. (1,2) Congenital Talipes Equino Varus or clubfoot is a birth defect attributed to atrophy of the calf muscles of leg, equinus of the ankle, varus of the hind foot, cavus of midfoot or adductus of the forefoot (3). It can be due to imbalance of planter flexors and dorsiflexors with both, the triceps surae and tibialis posterior being mostly affected. As a result of muscle belly shortening, their tendons are relatively longer than normal (4).

Initially, in prospect of epidemiology in 400 BC, Hippocrates identified the first clubfoot and they believed that the pressure from uterine molding on the developing foot caused the deformity (5). After that, two factors were stated by researchers that were genetic and environment (6). Many studies stated, multiple births, reduced amniotic fluid volume, prolonged gestation, and increased birth weight have also been suggested to cause decreased fetal movement, thus reduction in fetal movement causes the club foot (7,8,9). Furthermore, Wynne-Davies found concordance for clubfoot was the same between dizygotic twins and single births, providing evidence against decreased limb movement as a cause for clubfoot (10). Similarly, it was also concluded that the defect could be associated with neuromuscular disorders (11). Males are affected more often than females, thus females require more susceptibility loci than males (5,12). With the passage of time, findings also confirmed the previous studies that reported the associations with young maternal age, maternal education, young paternal and maternal (parents) age, parental smoking habits, and household smoking habits during the duration of pregnancy (13,14). Thereafter, many epidemiological studies carried out for the firm cause that maternal smoking habit during pregnancy greatly affects to cause the club foot in child (15,16).

A study was in need to confirm the aforementioned factors in the Pakistan. Owning to outcomes of earlier epidemiological studies; it will be first ever study on club feet to know the causes, particularly role of maternal smoking to cause club foot in Peshawar, Khyber Pakhtunkhwa. This study was carried out to explore the causes and role of maternal smoking to cause Congenital talipes equanovarus.

Methodology

This study used quantitative methods doing a cross-sectional survey. The study was conducted on Clubfeet patients at PRSP from 11th April 2014 to 30th May, 2014. Inclusion criteria were clubfeet from the general population and Telipus equanovarus patient were excluded. Study population was the Congenital talipes equanovarus patients equal or less than 24 months. There were 107 patients.

Data was collected directly from the parents via using a questionnaire. A self-developed questionnaire was used after seeking consent from the participants. A list of questions was generated through reviewing

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literature and sample questionnaires from relevant articles. The questionnaire consisted of different variables including demographics i.e. age, sex, level of parents’ education, diagnosis and causes like ages of the parents, family or cousins marriage, smoking which were extracted from the literature. All the information was collected by parents who were the respondents of study. The data were analyzed by using SPSS V 20.

**Results**

Sample size of study was consisted of 107 participants, among them 90 (84%) were male and 17(16%) females. The statistics showed that 69 (64%) of mothers were illiterate, moreover, there were 27 (25 %) mothers who had school level of education, 6 (6%) had college level of education and 5 (5 %) had university level of education. The study reflected that majority of respondents to a family with an average economic state i.e. average economic status was 48 (48%) then, 2nd majority of respondents were from a poor family i-e, poor family status was 32 (30%). Furthermore, 14 (13%) of respondents were from family with below average, 9 (8%) of respondents were from family with above average economic status and 1 (1%) of respondents from wealthy family. Respondent were mostly from the rural area of KPK i-e 81 (76%) of respondents were from rural area and 26 (24%) of participants were from urban area of KPK. Results of our study reflected that n=70 (65 %) participants were having bilateral clubfeet and n=37 (35%) were having unilateral clubfeet. And 27 (73%) of all the unilateral respondents were left sided. The result showed that majority of respondents was affected with left side.

Minimum fathers’ age was 18 years and maximum father’s age was 53 years. Mean fathers’ age was 30.48 (±5.60). By further classification of father age into limit, i-e between the age of: 18 to 27 years were 36 (34%), 28 to 37 years were 62 (58%), 38 to 47 years were 7 (7%) and 48 to 57 years were 2 (2%). The result clearly showed that majority of father’s age of participants lied in 28 to 37 years. Minimum mother’s age was 18 years and maximum age was 48 years. Mean age was 26.41 (±5.20). By further classification of father age into limit, i-e between the age of: 18 to 27 years were 63 (59%), 28 to 37 years were 40 (37%), 38 to 47 years were 3 (3%), 48 to 57 years were 1 (1%). The result clearly showed that majority of mother’s age of respondents lied in 18 to 27 years. Figure 1 reflects that there were majority of participants whose parents were married within the family, i-e 83 (78%) of respondent married within the family while 24 (22%) of respondents married outside the family.

There were no participants in the study whose parents were having club feet at their birth. From the sample size of 107, there were 71 (66%) participants who had sibling and 36 (34%) participants were the first child of their parents.

![Figure 1. Parents’ Marriage](image)

From the 71 participants who were having siblings, 18 (25%) participants were having effected siblings in which at least 1 and utmost 2 siblings were present. 53 (75%) were having normal siblings. There were 2 twins baby birth, both were monozygotic twin, one was male and other was female. One baby of twins was normal and another was affected with CTEV. Results showed that study contained no clubfeet whose mother did smoking during pregnancy. There were 47(44 %) participants whose fathers were smoker. There were only 4 participants whose family members use to smoke during pregnancy.(table 2) There were only five participants who had neuromuscular disorder, counting to that, 3 were Arthrogryposis, 1 was Spina Bifida, and 1 was Dystrophic Dwarfism.

![Table 1: Smoking during pregnancy](image)

<table>
<thead>
<tr>
<th>Smoking during Pregnancy</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Father</td>
<td>47</td>
<td>44%</td>
</tr>
<tr>
<td>Mother</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Household smoking</td>
<td>4</td>
<td>4%</td>
</tr>
<tr>
<td>No smoking</td>
<td>56</td>
<td>52%</td>
</tr>
<tr>
<td>Total</td>
<td>107</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Discussion**

The first variable was gender; this study consists of 107 participants, males were 84% and females were 16%. In contrast to present study of USA, there were only 72 participants, in which male were 61% and female were 39% (5). A study of Vietnam, Sample size =99, male was 63 and female were 33 % (4).

In this study, mothers level of education was low. Comparatively to the previous studies the mothers were educated. (10) Factors for illiteracy of mothers...
is: Pakistan has low literacy rate, which is 49% and mostly respondents were belonged to rural areas of KPK.

Mean of Paternal age in the study was 30.48 and mean of maternal age was 26.41, results of this study are similar to a case control study in America (10). Literature showed that young age of parents can cause CTEV in child. The result of the current study is not in accordance with the previous studies.

The involvement of bilateral clubfoot was greater than the unilateral in the current study. But according to a study conducted in America the number of the unilateral involvement was greater than the bilateral. (10) Furthermore, participants with left sided involvement were 53% and right sided were 47%. As similar to study of Vietnam, 52% bilateral and 45 were unilateral and right sided proportion was higher than left sided (17).

In the present study analyzed that 18 out of 107 had the family history. As compared to study on family history, 25 out of 346 had the family history of club foot (18). The important variable of this study is the role of maternal smoking during pregnancy. In contrast to present study, case control study done in UK in 2007 showed that there was strong association of clubfeet with smoking and frequency was greater in female than male children (male OR 1.16 [95% CI 0.53–2.55]; female OR 2.28 [95% CI 0.68–7.66]), the risk estimates were not statistically significant, nor was a formal test of interaction between sex and maternal smoking significant (p = 0.41). Fewer case than control mothers reported drinking alcohol during the index pregnancy (35% cases, 43% controls), but the differences were not significant (19).

The epidemiological study of USA, stated that 47% of parents of clubfoot patients reported presence of any smoking in the household during the child’s pregnancy compared to 17% of control parents corresponding with a p value of 0.00001192 (5). Honein et al (2000) demonstrated an interaction between maternal smoking and family history of CTEV, with an odds ratio of 20.30 (7.90–51.17) for the combination of maternal smoking and family history (18). The epidemiological studies of UK and USA indicate that there is high risk of maternal smoking as compared to paternal smoking but the result are similar regarding paternal smoking. All are contrary to results of this study. Factors which are seem in contradictions are i-e in Pakistan, women are very uncommon to do smoking in the society particularly women of KPK.

Conclusion
Many epidemiological studies being held to know the cause, even though it had been concluded that genetic and environmental factors play central role to cause the disorder but exact cause is remains unknown. The few participants had the family history. There was not a single mother in the current study who did smoking during the time of pregnancy. But, there were few children whose father did smoking during pregnancy. This study concluded by exploring that marriages within the family and paternal smoking may cause the CTEV. On the other hand, mothers were also involved in doing passive smoking, so there can be the possibility than CTEV can also be due to this smoking. No association had been determined between CTEV and maternal smoking so this can be better understand by calculating the association with greater number of participants.

REFERENCES

Authors’ contributions:
Junaid Akram: Revising article critically for important intellectual content for final approval. Responsible for data integrity.
Suhail Karim: Conception and design of the work and revising it critically for final approval. Responsible for data integrity.
Amir Shahzad: Conception and design of the work, the acquisition, analysis, interpretation of data, drafting the work and revising it for final approval. Responsible for data integrity.
Liaquat Ali Malik: Revising article critically for important intellectual content for final approval. Responsible for data integrity.