

RELATIONSHIP BETWEEN ETHNICITY AND TRAUMATIC DENTAL INJURIES AMONG 14 YEAR OLD CHILDREN IN NEWHAM — A DEPRIVED AREA OF LONDON

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ABSTRACT

This study was conducted to assess the prevalence of traumatic dental injuries (TDI) by ethnic groups in a sample of 14 year old children in East London, UK. The data used was for 2002-03 of children attending state secondary schools in Newham, London. A total of 589 fourteen year old school children were included in the sample. Following clinical examination and recording TDI to upper and lower incisors, participants completed a questionnaire which included information regarding the causes of TDI and the ethnic group the children belonged to. Data analysis was done using SPSS version 12.0 and included descriptive statistics which was frequency distribution and cross-tabulation.

Males (30.6%) had a higher prevalence of TDI than females (23.1%) and this was statistically significant ($P=0.038$). There was no association found between ethnicity and TDI ($P=0.062$), although the ethnic groups of Black African (31.6%), Pakistani (33.3%), and Whites UK (33.3%) were found more likely to have TDI than Black Caribbean (14.6%).

The study indicates that TDI are associated with ethnic groups and gender. However, ethnicity has no association with TDI. Further research is necessary to elucidate the relationship of ethnicity and TDI.

Key words: Traumatic dental injuries, Ethnicity, Dental trauma

INTRODUCTION

Any thermal, chemical or mechanical lesion that affects the dentition should be analyzed as a dental trauma and its effect, as a traumatic dental injury¹. Traumatic dental injuries (TDI) to the teeth are among the most serious of dental conditions² and have been shown to be a public health problem³. This is mainly because TDI may have an impact on children's quality of life. The majority of dental injuries involve the anterior teeth⁴, which may lead to restriction in biting, difficulty speaking clearly, and feeling embarrassed to show the teeth

The prevalence of traumatic dental injuries has been shown to be high and vary between different countries⁴ as well as in ethnic groups. These variations reflect the diversities in culture and lifestyle. Ethnic groups vary from each other and have multiple and different physical activities to each other that may relate to socioeconomic status, race or ethnicity, age, gender, or general health status.

“An ethnic group is a larger population having real or putative common ancestry, memories of a shared

past, and a cultural focus upon one or more symbolic elements which define the group's identity, such as kinship, religion, language, shared territory, nationality or physical collectivity within appearance. Members of an ethnic group are conscious of belonging to an ethnic group.”⁶ Some^{7,8}, argue that ethnicity should not be confused with nationality or with migrant status. They give an example of immigrants from the Indian subcontinent to the United Kingdom who may be British nationals but may be members of a particular ethnic group such as Sikh Punjabis. Senior and Bhopal⁹ refer to the concept of ethnicity as the social grouping(s) people belong to because of their culture, which includes language, religion, dietary and marital customs and other factors which relate to ancestry.

Several studies have shown diversities of TDI in 12 year old children in different ethnic groups^{10, 11, 12}. Variations in the causes of traumatic injuries have been observed in relation to ethnicity in some studies¹³. This variation may explain part of the disparity in the occurrence of TDI. It is relevant to understand further that effective oral health promotion is required to reduce TDI.

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METHODOLOGY

A cross-sectional survey design was adopted to assess the epidemiology of TDI in fourteen year old children attending state secondary schools in Newham, London. The data used was for 2002-03 for 14 year old children in Newham and was collected by Newham PCT in East London. Ethics Committee approval for the study was obtained from East London and City Authority.

The minimum sample size was estimated to be 750 and the size of the sample was calculated to give a standard error of less than 2%. The 95% confidence interval level and a prevalence of dental injury of 50% were also used for the calculation of sample size. The random sample of 14 year old school children was selected following the BASCD protocol¹⁴. All eligible 14 year olds enrolled in secondary schools of Newham, who had received the consent forms and agreed to be examined were included in the sample with the exception of children with severe learning difficulties, new enrolled non-English speakers who did not understand the questionnaire and with negative consent. ‘An Invitation to Participate’ in the study was also sent to parents and children as well as consent letters. Negative consent from children as well as parents was sought as this was accepted practice for in the Community Dental Service for children participating in both School Dental Inspections and BASCD surveys.

Data for this study was collected by carrying out a clinical examination followed by an interview. The clinical examination was carried out by a dentist (S.M) who was a BASCD trained and calibrated examiner and was also trained in the use of the data collection sheet and BASCD criteria. Children were examined at school during class hours. Lip coverage and presence or absence of dental trauma to all permanent incisors was recorded for each subject. Diagnostic criteria for assessing TDI and lip coverage were used to identify cases of TDI and inadequate lip coverage (Appendix 1). The visual dental examination only included TDI to the upper and lower permanent incisors using the criteria adopted in the Children’s Dental Health Survey in the UK¹⁵. The presence or absence of damage to all permanent incisors was recorded as ‘yes’ or ‘no’. The CPITN probe was used to detect damaged teeth that had been restored with composite restorations. If an incisor was missing, a positive history of trauma was gained by the child before the tooth was recorded as damaged.

All the permanent incisors which had been recorded as damaged were examined to assess the visual evidence of the extent of dental treatment which had been provided. If the fracture involved the pulp and there was evidence of root treatment having been

APPENDIX 1

Diagnostic criteria to assess TDI

Score	Criteria
Code 0	No injury
Code 1	Treated dental injury
Code 2	Enamel fracture only
Code 3	Enamel/Dentine fracture
Code 4	Pulp involvement
Code 5	Missing tooth due to trauma
Code 9	Excluded tooth

Diagnostic criteria to assess lip coverage

Lip coverage	Lip coverage is recorded as: Adequate : lips cover the incisor teeth at rest. If not it should be recorded as inadequate.
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performed via the fracture it was classed as root treated. If there was doubt about the treatment provided it was defined as unable to assess. Lip coverage was defined as adequate or inadequate depending whether the lips covered the incisor teeth at rest or not¹⁶.

Following the clinical examination, participants were interviewed using a questionnaire. The questions for confirming ethnicity of the children originated from the 2001 Census ethnic group questions asked in England and Wales (National statistics). Each questionnaire used had a code number, which was the same as that used on the data collection form.

The data collection sheets were checked for errors and omissions and corrected as necessary. Data was entered into a computer and only the codes were included in the files. Analysis was done using the SPSS package (version 12.0). Data analysis included descriptive statistics such as frequency distribution and cross-tabulation. Statistical significance for the association between the explanatory and dependent variables was assessed carrying out Chi-square statistical test. The level of significance was set at 5%.

RESULTS

The final sample size was 589 due to negative consent, children absent from school on the day of the study as well as children being excluded from the study due to the exclusion criteria previously described. The response rate was 78.5%.

The sample was composed of 294 males (49.9%) and 295 females (50.1%). (Table1). Ethnic variation was seen in the sample with the 19% of children being White UK followed by Black Africans (16%) (Table 2) The prevalence of TDI was observed to be higher in

TABLE 1: FREQUENCY DISTRIBUTION OF GENDER AND LIVING ARRANGEMENTS IN 14 YEAR OLD CHILDREN IN NEWHAM (n=589)

Variable	Frequency (n)	Relative frequency (%)	Valid frequency (%)
Gender			
Male	294	49.9	49.9
Female	295	50.1	50.1
Missing value	0	—	—

males (30.6%) than in females (23.1%). This difference was statistically significant (P=0.038). (Table 3)

There was large variation in the frequency distribution of TDI by ethnic groups. The highest number of TDI was seen in Pakistani ethnic group (33.3%) which was equal to Whites (UK & Irish) (33.3%) and it was as less as 14.6% in Black Caribbean ethnic group. Other

TABLE 2: FREQUENCY DISTRIBUTION OF ETHNIC GROUPS IN 14 YEAR OLD CHILDREN IN NEWHAM (n=589)

Ethnic groups	Frequency (n)	Relative frequency (n)	Valid frequency (n)
White UK	112	19.0	19.1
Black Caribbean	41	7.0	7.0
Black African	94	16.0	16.0
Black others	5	0.8	0.9
Indian	81	13.8	13.8
Bangladeshi	88	14.9	15.0
Pakistani	51	8.7	8.7
Asian other	13	2.2	2.2
Mixed/different	24	4.1	4.1
Not known	16	2.7	2.7
Middle East	2	0.3	0.3
White Irish	4	0.7	0.7
White Euro	11	1.9	1.9
White other	8	1.4	1.4
Latin American	2	0.3	0.3
Other ethnic	19	2.9	2.9
Mixed White/Asian	7	1.2	1.2
White Eastern European	1	0.2	0.2
Sri-Lankan	5	0.8	0.9
Turkish/Cypriots	2	0.3	0.3
Total	586	99.5	100.0
Missing	3	0.5	
TOTAL	589	100.0	

TABLE 3: FREQUENCY DISTRIBUTION OF TDI TO PERMANENT TEETH IN A SAMPLE OF 589, 14 YEAR OLD SCHOOL CHILDREN BY GENDER AND LIP COVERAGE (n=589)

	Dental Injury n (%)	No Dental Injury n (%)	P-value Chi-square analysis
Gender			
Male	90 (30.6)	204 (69.4)	0.038
Female	68 (23.1)	227 (76.9)	
All	158 (26.8%)	431 (73.2)	
Lip coverage			
Adequate	97 (23.2)	322 (76.8)	0.001
Inadequate	61 (36.1)	108 (63.9)	
All	158 (26.9)	430 (73.1)	

Asian ethnic groups such as Indian, Bangladeshi and Sri-Lankan had a percentage of 21%, 21.6% and 28% of TDI respectively. Ethnicity did not have any statistically significant association with TDI (P=0.062) (Table 4).

TABLE 4: FREQUENCY DISTRIBUTION OF TDI IN A SAMPLE OF 589, 14 YEAR OLD CHILDREN BY ETHNIC GROUPS (n=589)

ETHNIC GROUPS	Traumatic dental injuries		P value for chi-square test
	No injury (%)	Injury (%)	
White UK	66.7	33.3	0.062
White Irish			
Black Caribbean	85.4	14.6	
Black African	68.4	31.6	
Black other			
Indian	79.0	21.0	
Bangladeshi	78.4	21.6	
Pakistani	66.7	33.3	
Asian other			
Sri-Lankan	72.0	28.0	
Others (White eastern European)			
Mixed white Asian			
White other	83.7	16.3	
Middle East			
Mixed/different)			
Total	73.7	26.3	

The level of significance for the association between the causes of TDI and ethnic groups was not calculated because of a small number of subjects. However, Black Africans had a higher percentage of TDI due to sports and rough playing (35.5%) than Black Caribbean (Table 5). The level of significance for the association between TDI and different ethnic groups showed that Whites(UK) and Black Caribbean (P=0.040) had a strong association which was also found in the ethnic groups of Pakistani and Black Caribbean

(P=0.040). The association between Black Caribbean and Black African was highly significant (0.021) (Table 6).

The results show that there is no association between ethnicity and TDI. However, the ethnic groups of Black Africans, Pakistanis and Whites (UK) are more likely to have TDI than Black Caribbean. Gender and lip coverage showed statistically significant relation with TDI.

TABLE 5: FREQUENCY DISTRIBUTION OF CAUSES OF TDI TO PERMANENT TEETH IN A SAMPLE OF 589 14 YEAR OLD SCHOOL CHILDREN AND ETHNIC GROUPS (n=589)

Ethnic groups*	Violence		Accidents		Total
	Rough playing with others n (%)	Using teeth as a tool n (%)	Falls and collisions n (%)	Sports, Leisure n (%)	
• (White (UK & Irish))	79 (30.4)	5 (21.7)	5 (21.7)	5 (26.1)	23 (100.0)
• (Black Caribbean)	0 (0.0)	1 (25.0)	1 (25.0)	2 (50.0)	4 (100.0)
• (Black African, Black Others)	11 (35.5)	5 (16.1)	4 (12.9)	11 (35.5)	31 (100.0)
• (Indian)	2 (20.0)	2 (20.0)	2 (20.0)	4 (40.0)	10 (100.0)
• (Bangladeshi)	3 (30.0)	2 (20.0)	1 (10.0)	4 (40.0)	10 (100.0)
• (Pakistani)	4 (40.0)	4 (40.0)	0 (0.0)	2 (20.0)	10 (100.0)
• (Asian other, Sri-Lankan)	1 (33.3)	0 (0.0)	1 (33.3)	1 (33.3)	3 (100.0)
• (White eastern European, Mixed White Asian, White Other, Middle East, Mixed/different)	2 (50.0)	0 (0.0)	0 (0.0)	2 (50.0)	4 (100.0)

* The level of significance for the association between causes of TDI and ethnic groups was not calculated because of a small number of subjects.

TABLE 6: LEVEL OF SIGNIFICANCE FOR THE ASSOCIATION BETWEEN TDI AND ETHNIC GROUPS

Ethnic groups	Ethnic groups							
	White UK	White Irish	Black Caribbean	Black African	Indian	Bangladeshi	Pakistani	Asian other
White UK								
White Irish	0.181							
Black Caribbean	0.040*	0.411						
Black African	0.670	0.155	0.021*					
Indian	0.113	0.306	0.397	0.055				
Bangladeshi	0.127	0.297	0.352	0.062	0.924			
Pakistani	0.791	0.165	0.040*	0.931	0.114	0.128		
Asian Other	0.544	0.290	0.477	0.430	0.864	0.904	0.476	

* P<0.05

DISCUSSION

This research was carried out to understand the relationship between TDI and ethnicity. Different ethnic groups were observed in the present study and there was some variation in the frequency distribution of TDI in ethnic groups. This may be explained by the variation in the culture of these ethnic groups which leads to variation in lifestyles. These lifestyles tend to affect the children and therefore may also affect their exposure to TDI.

There was no significant association between ethnicity (ethnic groups on the whole) and TDI. A reason for this might be the cultural and social mixing of the ethnic groups in one region which allows them to live in harmony with each other adapting to the new environment and thus being one community. The community as a whole would then show no relation with TDI. If this community is broken down into its respective ethnic groups, the prevalence of TDI in these groups would vary. Studies¹⁷ have shown that ethnicity was not associated with TDI although some ethnic groups had higher odds of having TDI than the others. It was found¹⁷ that there was no association between ethnicity and TDI though Hispanics and African Americans had a slightly higher prevalence than Whites. Another study² had similar findings that race-ethnicity and TDI to the incisors were not statistically significant although studies have proved the opposite:^{18,19}

Gender was significantly related to TDI ($P=0.038$) and that males had a higher prevalence of TDI than females which is supported by other studies^{18,19,20,21,22,2,23,24,25,26,27,28,29,30}. This might be explained by observations that males participate in more strenuous activities with higher trauma risks, such as contact sports and more aggressive types of play. On the other hand, girls get involved in lighter sports that are less violent therefore presenting with a lower prevalence of TDI.

Inadequate lip coverage was found to be an important predictor of increased occurrence of TDI in children and this was consistent with findings from other studies^{31,32,33}.

The present study found factors such as gender, lip coverage and individual ethnic groups to be associated with TDI but found no strong association of TDI with ethnicity. This conclusion can lead us to further study into the field of research as well as dental public health. Based on the current findings, new hypothesis could be developed which would focus on the individual; ethnic groups and the prevalence of TDI. Statistical analysis for each of the ethnic groups would lead us to better knowledge of the relation between ethnicity and TDI.

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