

ORIGINAL STUDY

**EPIDEMIOLOGICAL DATA REGARDING DENTAL TRAUMA FROM
UPU-SMURD, DENTAL SERVICE, GALAȚI**

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ABSTRACT

This epidemiological study evaluated dentoalveolar trauma referrals and also their clinical type and distribution in different age groups of Galati region population. The time period was 3 years (2008-2011) and the survey took place in UPU-SMURD, Dental Service at „Sf. Apostol Andrei” emergency hospital, Galați. A retrospective study was used as research method. The epidemiological data were taken from the service’s registry books. The statistical analysis was performed by Student’s t test in SPSS 17.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Level of significance was set at $p < 0.05$. Graphics were realized using MS Excel and SPSS 17.0. The evaluation group consisted of 326 people who suffered only dentoalveolar trauma or to whom there have been associated other lesions in the mentioned time period. The addressability for this kind of pathology was 1,84%. Dental luxation with II-III degree of mobility were most frequently diagnosed at each group age. The hypothesis regarding frequential decrease of dentoalveolar trauma with aging was partially infirmed in this study. At first, the frequency increases, reaching a peak at 20-30 year old group, then indeed decreases with aging. The dentoalveolar trauma referrals at UPU-SMURD, Dental Service, Galați had a reduced frequency when compared to other pathology referrals, but not very different from other similiar services in the world.

KEYWORDS: *dentoalveolar trauma, aggression, emergency.*

1. Introduction

Dentoalveolar trauma is frequently associated with youth. The epidemiologic studies of dentoalveolar trauma mainly sustain this hypothesis [1-4]. Moreover, these studies are frequently set upon limited age groups [2, 4]. The older age group studies are less approached, even though 1 in 4 adults suffers dentoalveolar trauma before the age of 50 [5-7]. Furthermore, the severity and the number of

dentoalveolar units involved, in this cases are more significant „childhood” trauma [8]. Regarding this aspect, a limited age group survey may inflict serious study error. As so there is the risk of not noticing/ omitting different lesions/ mechanisms or times of occurrence of dentoalveolar trauma. For a relevant study, regarding the proposed purpose it is necessary to evaluate an entire population, at all ages and day times. There are very few dental services obeying these conditions [7, 9]. The best matching service is the regional UPU-SMURD emergency service [10].

In Romania most of these services were founded recently, after 2007 for most regions. The data and subsequent studies on different medical departments are very few at the time being [11-13]. Regarding this fact the present study presents data in addition to the field of dentoalveolar trauma research in Romania. The survey took place in UPU-SMURD, Dental Service at „Sf. Apostol Andrei” emergency hospital, Galați, founded in september 2007. The dentoalveolar trauma prevalence, and also the type of dentoalveolar injury and group age distributions were evaluated.

2. Material and Methods

A retrospective study based upon some epidemiological data of dentoalveolar trauma patients was conducted in this paper. The data came from UPU-SMURD, Dental Service’s registry books. The evaluation time period was 3 years (june 2008- june 2011).

Three variable groups were set, as so:

- Sociodemographics (name, age, gender, adress (city or country side));
- Logistics (arrival time of day);
- Characteristics and nature of dentoalveolar trauma (clinical type, associated lesions, treatment or recommendations).
- The data acquirence, evaluation and statistical analysis were made strictly upon the data sets in the registry books. Regarding the etiology of dentoalveolar trauma 2 causes were mentioned: aggression (fight) and other dentoalveolar trauma. As to injury type the following were mentioned:
 - Hard dental tissue lesions (dental fracture(crown/ crown and root/ root fracture), fisure);
 - Periodontal tissue lesions (subluxation, lateral luxation with I-II or II-III mobility degree, intrusion, extrusion, avulsion).

In order to achieve a proper statistical analysis

the study group was divided in 7 smaller age groups:

- 0-15 years;
- 15-20 years;
- and then from ten to ten years: 20 – 30 years; 30 – 40 years; 40 – 50 years; 50 – 60 years; 60 – 80 years.

The variables for each age group were: total number of patients, total number of lesions, total number of associated lesions and total number of lesions/ total number of patients ratio. The scoring was set from 1 to 7, depending on the variable value. In the case of equal variables, the lowest mark was scored and the upper one excluded. Example: there was an equal number of patients (49) at age groups 4 (30-40 years) and 5 (40-50 years). The 49 value was the 5-ith (lowest one was 31 (7-th’s group (60-80 years) and the score for it was 1), and highest one was 74 (3-rd’s group (20-30 years), and the score for it was 7). Both groups were scored 5 (instead of 5 and 6), 6-th score was excluded.

The statistical analysis was performed by Student’s t test in SPSS 17.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Level of significance was set at $p < 0.05$. Graphics were realized using MS Excel and SPSS 17.0.

3. Results and discussions

Prevalence study

In the 3 years of study there have been 17717 patients recorded and 326 dentoalveolar trauma cases. The addressability was 1,84%. There were 238 male patients and 88 female ones (2.7 ratio). Statistical significance among male-female groups was noticed ($p < 0,0001$). At each age group male patients suffered more lesions than female ones (table I and figure 1).

The majority of patients lived in the city areas (between 58,33 and 85% at different age groups). Statistical significance was noticed between city and country side groups ($p = 0,03$).

Table I. Patient distribution according to sex

Age group	N (M/F)	% (M/F)
0-15 years	22 / 18	55 / 45
15-20 years	36 / 11	76,6 / 23,4
20-30 years	59 / 25	66,22 / 33,78
30-40 years	38 / 11	77,55 / 22,45
40-50 years	36 / 13	73,47 / 26,53
50-60 years	26 / 10	72,22 / 27,78
60-80 years	21 / 10	67,74 / 32,26
Total	238 / 88	73 / 27

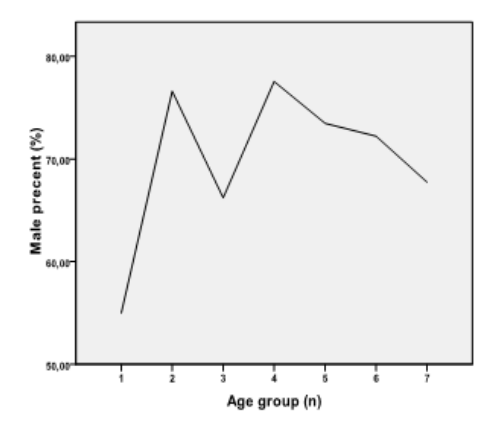


Figure 1. Male patient distribution

The time frames of most dental trauma reports (more than 50%) occurred (at almost all age groups) between 6am- 12 am(T1) and 12 am- 6pm(T2). The T2 time frame was most frequent at the following age groups: 0-15, 20-30, 30-40 years (33,78 % to 44,9 %) and T1 time frame at the following age groups: 40-50,50-60,60-80 years (40,82 % to 47,22 %). (Figure 2) One age group (15-20 years) reported different frequent time frame : 6pm -12 am (T3).

Common etiology was aggression (fight). The highest aggression rate was noticed at 2-nd group (15-20 years): 78,72%, and the lowest rate at group 1 (0-15 years) : 32,5%. At the others groups the rate was ranged from 58,05% to 69,44%.

Total number of dentoalveolar trauma cases was 677. Upper central incisors (21 tooth most frequently) suffered the most lesions (225 cases), while lateral teeth trauma was less frequent. The number of lesions for individual teeth and their

diferrent lesion types are shown in tables II and III.

Dentoalveolar diagnoses and distribution.

The severness of dental trauma, varying with number of dentoalveolar units affected (table II and IV) was the following: single affected units in more than 50% at age groups 6 and 7 (50-60 and 60-80 years). At the other groups multiple affected units scored values between 51,35% and 65%. No statistical significance was obtained between these groups (p=0,99). Associated lesions were found ranging between 5% at 0-15 age group to 23,40% at 15-20 age group.

Among the diagnostics (table III), teeth fracture (especially crown fractures) and dental luxations (especially the ones with II-nd to III-rd degree of mobility) are found in 87 % of all cases. Patients aged 20 to 30 years old (group 3) suffered the most dentoalveolar trauma cases : 151 (83 dental luxations, 59 dental fractures, 7 avulsions, 1 subluxation and 1 dental fissure). Dental luxations with II-nd to III-rd degree of mobility have been most frequently diagnosed at each age group (values ranging from 55,55% to 72,4%), except the first 2 groups (0-15 and 15-20 years) where dental luxations with I-st to II-nd degree of mobility were more frequent (56,7% to 61,7%). Avulsions were 3-rd ranked (values ranging from 4,65% to 25 %). The other lesions were observed less frequent (under 5% at the age groups ratio).

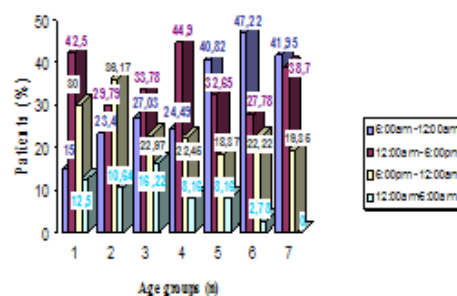


Figure 2. Distribution of visits by time of day

To highlight the age group predisposed to dentoalveolar trauma, based on the criteria and on the grading set, the following scores were obtained (score resulted from: total patients+ total lesions + injuries/ patient ratio+ number of other associated injuries non-dentoalveolar):

Group 0-15year = 3 +3 +7 +1 = 18, group 15-20years = 4+ 4+ 5+ 7 = 20, Group 20-30years = 7+ 7+ 3+ 6 = 23, Group 30-40years = 5+ 6+ 6+ 3 = 20, Group 40-50years= 5+ 5+ 4+ 4 = 18, Group 50-60 years = 2+ 2+ 2+ 4 = 10, Group 60-80years = 1+ 1+ 1+ 2 = 5 (figure 3).

Table II. Number of dentoalveolar trauma cases for each tooth at every age group

Frequency/ Age group	25 x (~)	22 x (~)	20 x (~)	18 x (~)	17 x (~)	15 x (~)	11 x (~)	10 x (~)	9 x (~)	8 x (~)	7 x (~)	6 x (~)	5x (~)	4x (~)	3x (~)	2x (~)	1x (cases)
0-15 years					21, 11					51, 22			12, 41, 31		52,32, 42	62, 33	53,85,82,81,71 72,36,13,14,23
15-20 years	21	11		12				22			31 41			32	23	42, 13	46,35,17, 15,24,27
20-30 years	21	11	22				12, 31		42			41	32	33, 23, 13	46	14, 24, 25 26, 45	35,36,43, 44, 47,48, 15
30-40 years					21	11		12	22	41	31	42		23, 13, 32	24,26	25,27, 14,43, 33	15,16,17,28,35 36,37,45,46,48
40-50 years					21	11		22	31	42, 12	41		32, 23	46	13	24,43	14,15,16,17,26 35,36,44,47
50-60 years								21			22 11		41, 31	32, 42, 33	43,12	44	14,16,17,23,24 34, 35,38,45,48
60-80 years										21,				22, 12	26,31	15,23, 24,27, 43	14,25,32, 33,34,35, 41,44,45, 47,48

Legend: In the first row there are listed the number of times a tooth was affected and in the next rows are the 7 age groups (example : tooth 21 suffered 17 injuries at age group 0-15 years and so on).

Table III. Dentoalveolar trauma type and distribution

Age group (years)	Dental luxations I-II / II -III	Subluxations	Dental fractures FC/FR/FCR	Fisures	Avulsions	Intrusion/ Extrusion	Total
0-15 years	34\26	0	24/0/1	0	7	1\2	95
15-20 years	29/18	0	44/1/1	2	7	0/0	102
20-30 years	32/51	1	56/1/2	1	7	0/0	151
30-40 years	16/42	0	22/6/0	0	24	0/0	110
40-50 years	20/31	0	33/1/7	0	11	1\0	104
50-60 years	9/19	0	15/1/3	0	16	0\1	64
60-80 years	12/15	0	14/1/2	0	6	1/0	51
TOTAL 326	152/202	1	208/11/16	3	78	3\3	677

Legend: 2-nd column reveals the ratio between I-II and II-III degree of mobility luxations and on the 4-th the ratio between fractures (crown/ root/ crown and root)

Table IV. Single/ multiple dentoalveolar trauma distribution

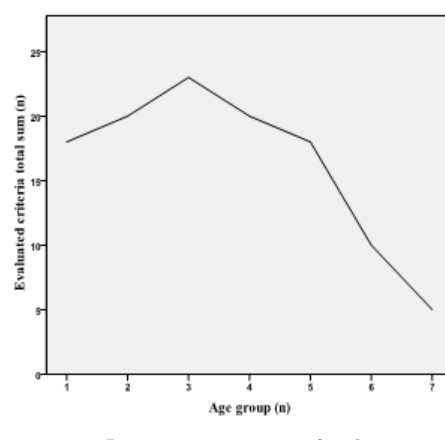
Age group (years)	Single dental lesion (N)	Single dental lesion (%)	Multiple dental lesions (%)	Multiple dental lesions (N)
0-15 years	14	9,58	14,45	26 ($\underline{15}=2x+ \underline{5}=3x+ \underline{4}=4x+ \underline{1}=5x+ \underline{1}=7x$)
15-20 years	17	11,64	16,67	30 ($\underline{18}=2x+ \underline{8}=3x+ \underline{2}=4x+ \underline{2}=5x$)
20-30 years	36	24,65	21,11	38 ($\underline{23}=2x+ \underline{7}=3x+ \underline{7}=4x+ \underline{1}=7x$)
30-40 years	20	13,69	16,11	29 ($\underline{16}=2x+ \underline{5}=3x+ \underline{5}=4x+ \underline{2}=6x+ \underline{1}=7x$)
40-50 years	20	13,69	16,11	29 ($\underline{15}=2x+ \underline{8}=3x+ \underline{4}=4x+ \underline{2}=5x$)
50-60 years	20	13,69	8,88	16 ($\underline{12}=2x+ \underline{3}=3x+ \underline{1}=4x+ \underline{1}=5x$)
60-80 years	19	13,04	6,67	12 ($\underline{6}=2x+ \underline{3}=3x+ \underline{2}=4x+ \underline{1}=7x$)
Total patients 326	146	100	100	180 ($\underline{102}=2x+ \underline{41}=3x+ \underline{25}=4x+ \underline{6}=5x+ \underline{2}=6x+ \underline{4}=7x$)

Legend: In the last column between brackets is shown the distribution of each multiple case occurrence (Example: at first row there were 26 cases of multiple trauma. These were distributed as following: 15 cases with 2 affected teeth/ patient, 5 cases with 3 affected teeth/ patient, 4 cases with 4 affected teeth/ patient, 1 case with 5 or 7 affected teeth/ patient).

4. Discussions

Patients with dentoalveolar trauma accounted for 1.84% of all evaluated patients (prevalence of 0.05% of the total county population: 611 040). This low addressability (compared to other studies) may be argued on the possible presentation of the patients directly at the Maxillofacial Surgery Service of the same hospital [14]. The less severe cases are treated more frequent in other private practices during their normal time schedule. Due to the recent founding of the UPU-SMURD- Dentistry services, comparative data on dentoalveolar trauma were not available from the specific literature (from Romania). Such reports were compared with data from international literature. A similar addressability ($\approx 3\%$) was observed in other emergency services (Dental Emergency Service of Bauru Dental School,

University of Sao Paulo, Brazil) [15].

**Figure 3.** Dentoalveolar trauma susceptibility

The ratio of male/female patients recorded in this study was 2,7: 1, similar to other results [16]. For different age groups, similar proportions were previously documented: in group 0-15 years [3, 15, 17] ($\approx 51-54\%$); 15-20,20-30 years [18] (2.6: 1, only

frontal teeth evaluated); 15-20 years [19] (76.92%). Different results on different age groups were also recorded (0-15, 20-30, 30-40, 40-50, 50-60, 60 - 65 ani) [19].

People in city areas have suffered more frequent dentoalveolar trauma, as whole population group and individually, at each age group separately (similar results were previously obtained) [14].

The most documented dental trauma cases were recorded between 12am- 6pm (99/ 116/ 80/ 31), contrary to the data obtained by Zheng and al. [14].

Aggression (fight) was documented as the predominant etiology. Previous studies conducted in similar population groups (or similar age groups) contradict these data [7,16,17,19,20]. A possible cause for the frequency of this etiology could be the role of this emergency service as first confirming authority in the case of legal proceedings, subsequent to an aggression with dental trauma.

The number of dentoalveolar trauma was 2,08 per patient. A similar report was found in other works made in the emergency services in Australia (Newcastle and Sydney). [21] However, most patients suffered unique dental trauma (146 patients – 44,79%), but the cumulative number of cases of multiple dental impairments (severness) resulted in the obtained proportion. Although this study was conducted in a hospital, the hypothesis (predominance of 2 injuries per patient) issued by Bastone et al. is not respected. The result tends to the category of prospective studies conducted in dental school clinics (prevalence of 1 trauma per patient) if we consider the previous case. A hierarchical result (similar number of dentoalveolar trauma per patient (patients who have suffered one trauma > 2 trauma > 3 trauma > 4 trauma) was obtained in other hospitals previously evaluated (Dental Department, Pakistan Institute of medical Sciences Islamabad), but with a lower total ratio (1.4) [19].

The number of cases with associated trauma

locally or generally was less than or about equal to that obtained in other studies (5-23% compared to 12% [14], 15% [26], respectively 50% [27]).

Dentoalveolar trauma were more commonly associated with maxillary central incisors (33.32% of cases - 17.57% tooth 21), similar to trends previously documented [3,7,15,25,28,29]. Frontal teeth have suffered the most injuries (78.3% - Table 3). This result is similar to previous data (Switzerland - 70.03% - Table V) [7].

The most frequent lesion type in the registry books (table III and VI), at each age group was the dental luxation (all clinical types equalled 53,32%). Even though luxations, as a group were first, crown fracture as a subgroup were most frequent at 2-nd and 3-rd age group and second frequent at the other age groups. The crown fracture ratio in this study was similar to general prerecorded tendencies [3,7,19,22,30].

The hypothesis regarding frequential decrease of dentoalveolar trauma with aging was partially infirmed in this study (figure 3) [31].

At first, the frequency increases, reaching a peak at 20-30 year old group, then indeed decreases with aging. As so 20-30 year old group was the most affected (according to the evaluated criteria). The result was different from other surveys (30-40 years, 0-5 years, 9-11 years and 6-10 years) in other geographic regions [7,17,19,22], and similar to a Sydney region study [21] (18-23 years group), but in this last study only frontal teeth were evaluated.

5. Conclusions

The dentoalveolar trauma referrals at UPU-SMURD, Dental Service, Galați had a reduced frequency when compared to other pathology referrals, but not very different from other similar services in the world.

Young people were more susceptible to

dentoalveolar trauma, especially between 15 and 30 years old. A possible correlation between age group (15-20 years)- etiology (aggression) – time of the day (6 pm -12 am) can be assumed.

Epidemiological data from the present study offer only a general picture on dental trauma in Galati region. More concrete data could be offered through a more adequate management of data recording process. Also patients should be recalled for follow-up appointments.

Table V. Dentoalveolar affected units

Dental group	Incisors	Canines	Bicuspids	Molars
Present study (%)	78,3	7,79	7,09	6,64
Bruner et al.(%) [7]	71,05	9,19	9,31	10,45

Table VI. Clinical lesions and their frequency

Trauma	Dental luxation	Dental fracture	Avulsion
Present study (%)	53,32	34,71	11,52
Wood et al.(%) [22]	43,12	49,41	7,45
Meadow et al.(%) [27]	59,67	33,72	6,61

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