ORIGINAL PAPER

HEALTH BEHAVIOR AND ORAL HEALTH STATUS AS INDICATORS OF CHILD ABUSE AND NEGLECT IN CHILDREN AND ADOLESCENTS. PRELIMINARY REPORT

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ABSTRACT

Introduction: Children coming from dysfunctional families, exposed to violence and negligence, when reporting to a dentist present several symptoms that can help in detection of child abuse.

Objectives: To compare oral health and hygiene status among child victims of domestic abuse under the protection of a welfare center and children from normative families treated in the Department of Pediatric Dentistry at Warsaw Medical University.

Material and methods: The study group consisted of children under the care of a social welfare institution across the Warsaw city. The control group was formed from patients of the Pediatric Dentistry Department of Warsaw Medical University. A clinical and questionnaire study were conducted. The presence of tooth injuries (Andreasen classification), caries and its consequences (DMFT/dmft, PUFA), oral hygiene status (OHI-S) and gingival condition were evaluated. The questionnaire study consisted of five questions concerning regular visits to the dentist's office, pain complaints, hygienic habits, prophylactic procedures, extraction and orthodontic treatment. The study was approved by the Bioethics Committee of the Medical University of Warsaw.

Results: The study involved 88 children of both sexes (average age: 8.09 ± 12.43). In the study group the study revealed more frequent occurrence of caries in permanent dentition (PUW 5.98 ± 1.23 vs. 2.43 ± 0.78, $p = 0.002$), presence of serious consequences of untreated caries (PUFA, F 1.2 ± 0.68 vs. 0.29 ± 0.05, $p = 0.031$), more frequent incidence of tooth injuries (29% vs. 2%, $p = 0.001$) and higher rates of oral hygiene index (OHI-s 1.8 ± 0.83 vs. 1.14 ± 0.32, $p = 0.003$). Children from the study experienced pain complains more often (66.7% vs. 22.7%), had worse hygienic habits (teeth brushing once a week 20% vs. 4.5%) and had undergone tooth extractions due to caries more often (33.3% vs. 15.9%).

Conclusion: Dental and hygiene negligence are part of battered child syndrome.

Key words: domestic violence, child abuse, dental neglect, battered child syndrome.

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INTRODUCTION

Knowledge of the problem and the symptoms of child and youth abuse and neglect is the basis for prevention and diagnosis and early intervention. According to a nationwide diagnosis of the problem of violence against children, every third teenager is a victim of violence [30]. Polish police report [20] that in the years 2005-2010 there were 19,2464 registered cases according to the "Blue Card" procedure of violence against children up to the age of 13 and 93,504 cases against youth aged 13-18. One of the problems mentioned in the Empowering Children Founda-

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tion's report on violence against children is the low level of health care employee's involvement in the Blue Card procedure. This is also confirmed by the results of a study conducted in 2012 by the Ministry of Labor and Social Policy [6]. In the case of children not covered by the activities of educational institutions, the involvement of health care practitioners, including dentists, in recognizing and reporting cases of child abuse and neglect is particularly important. The Act on Prevention of Violence from the year 2005 gives the following definition of domestic violence: "One-time or repeated intentional act or omission violating the rights or personal goods of family members, in particular exposing these persons to the risk of losing life and/or health, violating their dignity, physical integrity, freedom, including sexual, causing damage to their mental health, as well as causing suffering and moral harm" [1]. Child abuse can range from ignoring a child's physical and emotional needs to physical, psychological or sexual violence. The inability of the parent to identify or provide for the child's needs, to follow the treatment plan and medical recommendations, as well as dental treatment avoidance attitude, is part of parent's abusive behavior. Negligence, including dental negligence, is one of the forms of violence against children that can be diagnosed in a dental practice [28]. Doctors' involvement and their willingness to act in the direction of social and legal assistance play a very important role in relation to the abused child.

OBJECTIVES

The objective of this study was to compare oral health and hygiene status and habits among child victims of domestic abuse under the protection of a welfare center and children from normative families treated in the Department of Pediatric Dentistry at Warsaw Medical University.

TABLE 1. Characteristics of the studied groups

Parameter	Study group	Control group
Size, *n*	44	44
Average age, years	3.33 ± 12.43	8.09 ± 12.43
Gender, *n* (%)		
Boys	16 (36)	25 (57)
Girls	29 (66)	19 (43)
Dentition, *n* (%)		
Deciduous	3 (7)	13 (29)
Mixed	12 (27)	20 (45)
Permanent	30 (68)	11 (25)
Large family, *n* (%)	12 (27)	8 (18)
Superintendent, *n* (%)	14 (32)	–
"Blue Card", *n* (%)	9 (20)	–
Social Welfare Centre, *n* (%)	32 (72)	–
Single-parent family, *n* (%)	25 (57)	–
Foster home, *n* (%)	5 (11)	–

MATERIAL AND METHODS

The study included children and youth aged from 3 to 17 years, including victims of domestic violence under curatorial care and the Social Welfare Centre (the study group) and generally healthy, reporting to the Department of Children's Dentistry of WUM (the control group), and their parents/legal guardians. The prerequisite for participation in the study was the written consent of the parent/legal guardian and the consent of the children above 16 years old to take part in the study. The clinical and visual examination, conducted by one investigator, took place in the conditions of a dental office – in the light of a dental chair and by the use of a basic diagnostic set. In the clinical examination we assessed the presence of caries and its consequences (DMFT/dmft – decayed, missing, and filled teeth, PUFA – an index of clinical consequences of untreated dental caries – pulpal involvement, ulceration, fistulas and abscess) oral hygiene status (OHI-S index by Greene and Vermilion), gingival condition (GI – gingival index by Loe and Silness) as well as presence and type of traumatic tooth injuries (according to Andreasen's classification). During the examination, a psychologist, who assessed the children's behavior in relationship with the doctor and parents/guardians, was present. We also performed the analysis of the files of the protégés of the Family Support Centre. The parents/caregivers and the head of the Social Welfare Centre did not agree to taking photographs during the examination. The questionnaire survey consisted of five questions concerning regular visits to the dentist, pain complaints, hygienic habits, prophylactic procedures, performed extraction and orthodontic treatment. The results were analyzed statistically using STATISTICA 13.1 (Student's *t*-test, Mann-Whitney *U*-test). The level of statistical significance was assumed to be $p < 0.05$. The study was approved by the Bioethics Committee of the Medical University of Warsaw (number: KB/14/2017).

RESULTS

The study involved 88 children and youth of both sexes, including 44 victims of domestic violence (average age 3.33 ± 12.43 years) and 44 in the control group (average age 8.09 ± 12.43 years). There were fourteen children under the curatorial care (32%), nine with an active Blue Card (20%). 72% of children from the study group were under the constant supervision of the Social Welfare Centre. In 57% of cases the family was incomplete and 11% of them are now living in foster families. In nine (20%) of the cases, the fathers had limited parental rights. The children and youth experienced or were witness of physical and psychological violence. The characteristics of the studied groups are presented in Table 1.

In the study group, a higher intensity of caries disease was observed (DMFT 5.98 ± 1.23 vs. 2.43 ± 0.78, $p = 0.002$, respectively) and the consequences of untreated caries, especially presence of active fistulas (PUFA component F 1.2 ± 0.68 vs. 0.29 ± 0.05, $p = 0.031$, respectively). The number of teeth with carious diseases in permanent teeth was also higher (D 4.73 ± 1.63 vs. 0.68 ± 0.04, $p = 0.004$, respectively). The value of the dmft index was almost twice as high in the control group due to a statistically significantly higher "f" component of the index (f 0.39 ± 0.03 vs. 1.5 ± 0.77, $p = 0.002$ respectively) (Table 2). The study group was also characterized by significantly more frequent occurrence of tooth injuries (29% vs. 2%, $p = 0.001$) and higher values of oral hygiene indexes (OHI-S 1.8 ± 0.83 vs. 1.14 ± 0.32, $p = 0.003$) and the gingival index (GI 1.1 ± 0.8 vs. 0, $p = 0.041$).

In the study group more frequent occurrence of pain during the study was observed. Parents/legal guardians described these complaints as severe (66.7% vs. 22.7%, $p = 0.004$). So far, 2.23% of respondents have not visited the dentist's office, and 20% of them brush their teeth once a week. The results of the questionnaire study and information from the medical and dental interview are presented in the table (Table 3).

During the study, the children's appearance and behavior were assessed. Apart from measurable indicators, numerous differences in behavior and general condition of the examined children were observed. The results are presented in the table (Table 4).

The following behaviors were considered as untypical: anxiety, nervousness, excessive, inappropriate shyness, inappropriate reaction to stress, tension, aggression. These observations were consulted with a psychologist. Observation of behavior was used to create a questionnaire for evaluating the child's behavior in the dental office.

DISCUSSION

Violence against children often remains undisclosed due to its specific nature – children, being dependent on the perpetrator, hide their problems because of their sense of fear, shame and helplessness. Children who experience or witness domestic violence very rarely ask for help or speak about their problems directly. That is why it is so important to be particularly careful, thorough and accurate in observing the child during dental examination and treatment [29]. Untreated dental caries, periodontal diseases and poor oral hygiene can lead to pain, loss of function and chronic local infection, which can spread, causing generalized inflammation and even serious life- and health-endangering complications. This increases the need for prolonged and costly treatment, often linked to endodontic and surgical treatment, and puts the child at risk of having to undergo long-term antibiotic therapy or even treatment under general anesthesia [21]. Signs observed during the ex-

TABLE 2. Oral health and hygiene status in children and youth who are and are not victims of domestic violence

Parameters	Study group	Control group	*p*-value
DMFT	5.98 ± 1.23	2.43 ± 0.78	0.002*
DT	4.73 ± 1.63	0.68 ± 0.04	0.004*
FT	1.24 ±0.62	1.75 ± 0.7	0.794
dmft	1.98 ± 0.85	3.14 ± 1.23	0.097
dt	1.6 ± 0.7	1.46 ± 0.06	0.188
ft	0.39 ± 0.03	1.5 ± 0.77	0.002*
OHI-S	1.8 ± 0.83	1.14 ± 0.32	0.003*
GI	1.1 ± 0.8	0	0.038*
PUFA	3.32 ± 2.3	1.48 ± 0.82	0.039*
P	2.36 ± 1.57	1.33 ± 0.77	0.049*
U	0.3 ± 0.05	0	0.740
F*	1.2 ± 0.68	0.29 ± 0.05	0.021*
A	0	0	0.991
Tooth injuries	29%	2%	0.001*
Incisors	61.5%	100%	0.123
Lateral teeth	38.4%	0	0.000*

**Statistically significant*

TABLE 3. Results from the analysis of files and observation of patients' behavior

Parameters	Study group	Control group	*p*-value
Regular dental checkups (at least 1 per year)	57.8%	79.5%	0.077
Never been to a dentist before	2.23%	0	< 0.001*
Tooth brushing			
Once a week	20.0%	4.5%	0.020*
Once a day	26.7%	36.4%	0.433
Twice a day	46.7%	52.3%	0.008*
Pain complaints during the examination	66.7%	22.7%	0.004*
Extraction due to caries	33.3%	15.9%	0.158
Fluoride prophylaxis	46.7%	43.2%	0.780

TABLE 4. Results from the analysis of files and observation of patients' behavior

Parameters	Study group		Control group	
	n	%	*n*	%
Self-mutilation marks	1	2.23%	0	–
Burn marks	1	2.23%	0	–
Beating marks	1	2.23%	0	–
Stuttering	1	2.23%	0	–
Atypical behavior	18	41 %	1	2%
Negligence in basic hygiene	19	43.2%	5	11%
Stimulants	5	11.4%	1	2%

amination – presence of carious lesions, active fistulas, statistically more frequent complaints of severe pain and worse oral hygiene – in the group of children from dysfunctional families constitute the image of dental negligence. Neglect is defined as lack of fulfillment of basic physical (nutrition, clothing, shelter, hygiene, medical care, education) and emotional (sense of security, love, care and concern, support) needs of a child [8, 23]. Dental negligence is a broadly described phenomenon in the literature.

The authors underline specific symptoms of dental negligence: failure or delay in seeking appropriate dental treatment [4, 7, 15, 18, 19, 25], non-compliance with medical and dental recommendations [4, 18, 19, 25, 27] and negligence in oral hygiene [4, 13, 19, 27]. The visible symptoms of neglect are additionally low weight and low height, lack of basic hygiene, clothes unsuitable for the season, and gender. In the study, hygiene negligence was observed in 43.2% of children from the study group. 2.23% of patients who are under the care of social welfare institutions have never before attended a dental appointment and 20% of them brush their teeth only once a week. Oral hygiene and gingival index were significantly higher in the study group (OHI-S 1.8 ± 0.83 vs. 1.14 ± 0.32, $p = 0.003$; GI 1.1 ± 0.8 vs. 0, $p = 0.041$). In the study group, the incidence of caries in permanent teeth was twice as high (DMFT 5.98 ± 1.23 vs. 2.43 ± 0.78, $p = 0.002$), as well as the presence of consequences of untreated caries, i.e. the need to extract teeth due to caries (33.3% vs. 15.9%) or the presence of active fistulas (PUFA, F = 1.2 ± 0.68 vs. 0.29 ± 0.05, $p = 0.031$). The present study is in line with a study conducted in Canada where extensive caries was found in 58% of children experiencing violence and neglect compared to children from normative families where the percentage of advanced caries was 6% [26]. Smitt *et al.* [21] and Lourenco *et al.* [16] also reported a higher percentage of children with extensive caries as an indicator of dental negligence. They observed the relationship between the occurrence of caries and the perception of child's oral health by caregivers, as well as with the access to dental care. Many studies on the problem of experiencing domestic violence have highlighted the increased incidence of caries in children from dysfunctional families [4, 7, 9, 13, 15, 16, 18, 19, 25-27]. Very often, parents register their children with the dentist only when pain complaints occur. This practice may imply the need for more radical treatment: multiple visits, treatment of extensive caries and pulp involved diseases, multiple local anesthesia, painful procedures, tooth extraction, the need to prescribe antibiotics and analgesics, and even treatment under general anesthesia. Mansour *et al.* [18] in the study described dental negligence as a cause of extraction of deciduous and permanent teeth due to extensive caries. Research confirms that children with dental negligence are more often in need of treatment under general anesthesia, suffer from acute toothache, are more likely to be neglected in oral hygiene and their parents regularly cancel visits to the dentist [15, 21]. The experience of severe pain in children from dysfunctional families has been documented in many studies on dental neglect [15, 18, 27]. In the study group more frequent occurrence of pain during the study was observed. Patients described these complaints as severe (66.7% vs. 22.7%, $p = 0.004$). Many previous studies on this subject confirm the observations that children experiencing domestic violence are characterized by advanced caries disease, poor oral hygiene and inflammation of the mucous membrane and gums [2, 5, 9, 22, 26]. Another symptom of domestic violence suggested by the authors is dental injuries – 50% to 75% of all cases of child abuse involve trauma to the mouth, face and head [3, 11, 24]. Dentists are therefore ideally placed to recognize the symptoms of domestic violence. In the study group, on the basis of medical documentation, more frequent occurrence of tooth injuries in the study group was found (29% vs. 2%, $p = 0.001$). In the control group the injuries involved incisors but in the study group as many as 38.4% of the cases involved lateral teeth (premolars and molars). Oral trauma related to the experience of domestic violence, which has been described in the literature, includes wounds of the lips, cuts, wounds within the mucous membrane, i.e. abrasions, redness, petechiae and tooth injuries (crown fractures, tooth nodules, embossing, puncture) [28]. Becker *et al.* noted that the most common intraoral injuries encountered in cases of child abuse were contusions, redness in 43%, 28.5% were abrasions and injuries within the oral mucosa, and only 28.5% were dental injuries [3]. Problems with the detection and more comprehensive examination of intraoral injuries may arise from the fact that dentists rarely participate in the assessment of cases of suspected child abuse and neglect in the hospital environment [12].

A visit to the dentist's office is a stressful situation for a child, which may naturally reveal abnormal stress management strategies. Children experiencing physical violence are characterized by psycho-physical development disorders, e.g. difficulties in establishing relationships, speech fluidity disorders, behavioral disorders – they are aggressive, uncertain, withdrawn, apathetic [8, 23]. During the study, we observed some worrying behaviors of children from the study group, i.e. nervousness, excessive, inappropriate shyness, inappropriate reaction to stress, tension, and aggression. Kvist *et al.* discovered that children who have experienced abuse and neglect demonstrate more problems with cooperation and proper behavior during dental treatment [14]. This finding is consistent with Gustafsson's study of the relationship between abuse and neglect of children with cooperative problems, behavioral disorders during visits to the dentist's office [10], e.g. stoicism during dental treatment, silent and passive acceptance of even painful procedures, difficulties in communication and cooperation. The time

needed for dental treatment is long enough to observe unusual behavior, whether there are visible traces of domestic violence on exposed parts of the body – cigarette burn scars, beating marks (symmetrical, varying degrees of healing, around the eyes, ears and neck), scars from self-injuries. In the case of suspicion of domestic violence, it is necessary to make a thorough socioeconomic, medical and dental interview. Detailed intra- and extraoral examination and careful and empathic observation of the child's behavior in the dentist's office may help in making decisions about the intervention.

CONCLUSIONS

Dental examination should consider the possibility of detecting signs of domestic violence. Dental and hygiene neglect is a component of the battered child syndrome. Further research on this subject will make it possible to develop an appropriate algorithm of dealing with suspected cases of child abuse and neglect and may identify a group of symptoms that should raise our doubts.

CONFLICT OF INTEREST

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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