Relations between dental and somatic pain in children

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Purpose. To study relations between somatic and dental pain complaints among children who attend a university pediatric dental clinic.

Methods. Forty-seven boys, 32 girls aged 4–13 years (mean age 8.41 ± 2.29 years) participated in the study. Demographic information was obtained from the parents. Children were asked if they had experienced any dental pain during the previous week, the time of day the dental pain had appeared, and their actions when pain had been felt. Then, children were asked to complete a Pain Rating Scale for subjective evalua-

tion of pain regarding various potentially painful organs.

Results. The majority of the children suffered headaches, stomachaches, and leg pains, regularly. The younger children, aged 4–7 years, significantly reported more ear and stomach pains than the older group, aged 8–13. Significantly, more children who suffered from dental pain also reported more stomachaches. Firstborn and second children had significantly less current dental pain, compared with third children or more.

Conclusions. The results of our study suggest that children with dental pain suffer more often of stomachaches than children without dental pain. This may occur because these children are possibly more anxious about a potential treatment.

Introduction

Pain is difficult to define because of its subjective nature. The present common definition of pain is 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'¹.

It has been suggested that children's chronic pain affects and is influenced by family factors². Pain experienced very early in life may influence nociceptive processing over the rest of the lifespan³: thresholds for withdrawal from heat stimuli are also lower in younger children. Early tissue injury can affect future pain processing through developmental alterations in nociceptive circuitry.

Children suffer pain from many sources. Research on the neurobiology of pain in early development has shown that infants, and children of all ages, have the capacity to perceive pain^{3,4}. Short-term pain lasting minutes, hours, or days may be caused by illness, trauma, or by medical procedures such as immunization, blood tests, and surgery⁵. Intrusive events such as venipunctures or invasive diagnostic procedures are reported to be more painful by younger than by older children because they are generally unable to rationalize painful experiences⁶.

Stomachaches, headaches, limb pain, and chest or back pain are experienced occasionally or frequently by up to 30% of children⁷. Even when such pain seems relatively minor in intensity, it may interfere with school and family life, causing both emotional and financial burden⁸.

Population studies highlighted the relationship between pain and deprivation⁹. It was shown that the prevalence of chronic pain varied with socio-economic levels and was highest among blue-collar workers of all ages. White-collar workers reported chronic pain less often than other groups. A modest relationship was found between reported low back pain and social class in a cross-sectional survey¹⁰. The authors also showed, in a 1-year follow-up study, that people from lower social classes were more likely to consult with a new occurrence of low back pain. Subjects with low educational or economic status were found more likely to report one or more

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oro-facial pain symptoms¹¹. More recently, it was found that for persons aged 20–64 years, those from lower socio-economic status characteristics were more likely to report tooth pain, and endure their pain without the benefit of dental care, compared with their counterparts with higher socio-economic status characteristics¹². It is not fully established why people of the lower social class are more likely to complain of pain. One possible theory for this is that lower class people do more physical work, have less control over their work and live under less ideal circumstances.

Dental pain is highly prevalent among children, even in contemporary populations with historically low levels of caries experience. Dental pain is consistently associated with population's levels of caries experience, the association being most apparent in lower socio-economic groups with reduced access to care^{13,14}.

Overall, 11.8% of Maryland school age children in kindergarten and third grade have had some dental pain. Among children who have had caries, the report of dental pain increases to 28.2%. Children from families with low educational attainment or eligible for free or reduced meals or are covered by Medicaid are more likely to have experienced dental pain¹⁵.

Children as well as adults remember pain from visits to the dentist or the physician.

Children's pain can be difficult to recognize because they may lack the cognitive ability or vocabulary to relate, pinpoint, or describe their pain in a way that their caregivers easily understand.

Developmentally appropriate pain selfreport tools are available for children 4 years of age and older. Specific assessment tools have been developed to infer pain from behaviours or physical signs in very young or disabled children who are unable to report their own pain^{16–18}.

Research is needed to clarify the many aspects of children's pain and its management that remains poorly understood^{19–21}.

The purpose of the present investigation was to study relations between dental and somatic pain complaints among children who attend a university pediatric dental clinic.

Materials and methods

Children who attended the Department of Pediatric Dentistry's student dental clinic at the Tel Aviv University School of Dental Medicine (TAUSDM) participated in the study. They were included in the study on the basis of their parent's agreement. Paediatric dental treatment provided by students at TAUSDM is free of charge. Children attending the clinic come primarily for financial reasons. Most of them live in neighbourhoods in and around Tel Aviv in apartments where it is common to have three children living together in one room.

Ethical approval was obtained by the Tel Aviv University Faculty of Medicine Ethics Committee. A written consent was obtained for every child from either the parent or guardian. This took the form of an explanatory information sheet and a consent form. A verbal assent was also obtained verbally from the child.

Seventy-nine children (47 boys, 32 girls) between the ages of 4 and 13 (mean age 8.41 ± 2.29 years) participated in the study. All patients were healthy, none of them were presented for emergency treatment.

The parents were asked to complete a questionnaire which asked for demographic and personal details: place of birth, number of children in the family, the child's order in the family, number of rooms in their home, number of years of the father's education, and previous visits to the dentist. Children were asked if they had experienced any dental pain during the previous week, the time of day the dental pain had appeared (school hours, afternoon, evening, night), and their actions when pain had been felt (nothing, inform parents). Then, children were asked to complete the Wong-Baker FACES Pain Rating Scale (FPS)²² for subjective evaluation of feelings regarding the various potentially painful organs.

Verbal instructions were given to the child on how to utilize the FPS. The FPS measures the unpleasant or affective dimension of a child's pain experience. The child is shown a set of six cartoon faces with varying facial expressions ranging from a smile/laughter to that of tears. Each face has a numerical value from 0 to 5, where 0 indicates 'no hurt' (or no pain), and 5 indicates 'hurts worst' (or most painful). The child selects the facial expression that best represents his/her experience of discomfort. The child is asked to select the face, 'which looks like how you feel deep down inside, not the face you show to the world'. The FPS shows good construct validity as a self-report pain measure. A visual analog scale (VAS) was used to confirm the results of the FPS scale. The VAS scale is comprised of a 100 mm line from left to right, where 0 indicates 'no pain' and 100 indicates 'most painful'. The operators used the same narrative words and approaches in explaining the procedures for the use of FPS and VAS to the children.

Statistical analysis

Chi-square statistics were used to analyze the data. Data were input in the SPSS statistical program version 11.00 (SPSS Inc. Chicago IL, USA).

Results

There were 47 boys and 32 girls (mean age 8.53 ± 2.33 and 8.23 ± 2.26 years, respectively). All children and their parents were born in Israel.

Four children (5%) were only children, 14 (18%) had one sibling, and 61 (77%) had more than one sibling. The average number of children in the family was 3.08 ± 2.17 (range 1–10 children). Nineteen children (24%) were firstborn, 21 (27%) were second in order, and 39 (49) were third or more in order.

Three children lived in a two-room apartment, 13 lived in a three-room apartment, whereas the majority (63 children) lived in apartments with more than three rooms.

Regarding the father's education, 38 fathers (48%) had 12 years of formal schooling, whereas 41 (52%) formally studied more than 12 years. Fifty-nine children (75%) had had dental treatment previously, whereas 20 did not. Thirty-three children (42%) reported current dental pain, whereas 46 (58%) reported no current dental pain.

The vast majority of the children did not respond to the question of pointing the time, in which dental pain had occurred.

Children reacted more easily to the face scale, and felt uneasiness pointing out the exact level of pain on the VAS scale. Therefore, it was decided to use only the face scale for the comparisons.

Table 1 presents the frequency distribution of somatic pain. Fourteen children (18%) reported no headaches at all, 20 (25%) reported no stomachaches, and 25 (32%) reported no pain in the legs (during sport activities, etc.). This means that regarding headaches, stomachaches, and leg pains, 82%, 75%, and 68% of the children regularly suffered pain of various degrees of intensity.

The younger children, aged 4–7 years, significantly reported more ear and stomach pains than the older group, aged 8–13 (Table 2).

Table 1. Frequency distributions of somatic pains (n = 79).

Score Organ	0	1	2	3	4	5
Head	18%	15%	25%	18%	14%	10%
TMJ/chewing muscles	70%	8%	6%	8%	8%	1%
Ears	46%	18%	11%	6%	6%	13%
Back	56%	15%	8%	9%	4%	9%
Stomach	25%	10%	14%	22%	11%	18%
Hands	49%	14%	13%	11%	4%	9%
Legs	32%	24%	22%	8%	9%	6%

Table 2. Age and pain scoring.

	Pain in other organs		
	4–7 years (n = 32)	8–13 years (n = 47)	P *
Dental pain	42%	42%	
Head	81%	83%	
TMJ	48%	31%	
Chewing muscles	75%	25%	
Ears	77%	40%	0.002
Back	48%	42%	
Stomach	81%	71%	0.002
Hands	55%	48%	
Legs	58%	75%	

*Chi-square analysis.

Table 3 shows the distribution of somatic pain among children who had dental pain during the week prior to the completion of the questionnaire, and children who had not. Although significantly more children who suffered from dental pain also reported more stomachaches compared with children who did not have dental pain, no difference was found regarding other organs.

Table 4 shows the order of the child in the family complaining about current dental pain. Firstborn children and second children had significantly less current dental pain, compared with third children or more (P = 0.05).

Reports about somatic and dental pains were more prevalent among girls than among boys. Yet, the difference was not statistically significant. The gender difference was most pronounced regarding Temporo mandibular joint (TMJ)/chewing muscle pain.

Table 3. Distribution of somatic pain among children who had dental pain during the last week and children who had not .

	Pain in other		
	Dental pain (n = 33)	No dental pain (n = 46)	P*
Head	85%	80%	NS
TMJ	30%	43%	NS
Chewing muscles	21%	37%	NS
Ears	55%	54%	NS
Back	33%	52%	NS
Stomach	94%	41%	0.002
Hands	58%	46%	NS
Legs	73%	65%	NS

*Chi-square analysis.

Table 4. Order of child and complaining about currentdental pain.

	Dental Pain now	No dental pain now		P*
Child order: 1st and 2nd	12 (36%)	28 (61%)	40	0.05
Child order: 3rd and up	21 (64%)	18 (39%)	39	
Total	33	46	79	

*Chi-square analysis.

Discussion

Less than half of the children who attended our clinic reported about current or recent dental pain. The number of family members, the size of the apartment, as well as fathers' education, and previous dental visits to the dentist did not seem to have any influence on reporting about dental or somatic pain, or about taking any action during the pain sensation. Our findings demonstrate no association between these demographic factors and pain or pain behaviour. This finding must be observed under reservation, in the light of the homogeneous nature of the sample: the children attended the same university dental clinic which does not charge a fee for treatment. Nevertheless, our findings are to some extent not in agreement with previous reports^{10,15}.

The finding that third children and up in order reported more pains may point to their pain behaviour: it may be explained in the context of family factors, as they seek more attention by complaining about pains when parents' attention is diverted to other siblings².

The results of our study demonstrate that the majority of children who attended our clinic reported on headaches and stomachaches (82% and 75%, respectively). Yet, only 42% of the children reported on current dental pain. This finding is higher than the one found in a recent study, which states that nearly 12% of children suffered from dental pain¹⁵. The previous study was carried out in the general population of kindergarten and school-aged children, whereas our children attended a pediatric dentistry clinic. In our patients, headaches were more prevalent.

It seems that children can differentiate between dental and somatic pains.

Stomachaches seem to play a role in children's 'pain experience'. Younger children reported more on stomach and ear pains. These organs are known to be prone to inflammations, thus causing uneasiness and pains. Yet, the younger children did not report more on dental pain. This finding is not in agreement with a previous study, which demonstrated that Intrusive events or invasive diagnostic procedures are reported to be more painful by younger than by older children⁶. These conflicting results may still be taken in the context of lack of complete understanding of the nature of pain among small children as well as their difficulty to categorize and describe the pain. In addition, it may point to the genuineness of the children's self-report on somatic pains.

Stomachache was reported among 75% of our population. This finding is much higher than the one found in a recent report⁷. Yet. the previous study was carried out among the general children's population, whereas our study included children who attended a pediatric dental clinic. Stomachaches seem to differentiate between children with current or recent dental pain and children who have not reported on dental pain, as more of the children with dental pain also had stomach pain. Therefore, it seems logical that asking a child about stomachaches when visiting the dentist may be helpful in assessing a child's dental pain. Yet, children with dental pain could also be anxious about the upcoming treatment, thus resulting in stomachaches.

There was a nonsignificant gender difference in girls reporting more on somatic pain, TMJ/chewing muscles in particular. This finding must be regarded in a larger context. In the literature, studies show gender differences in regard to anxiety, dental anxiety, and pain, where these are more prevalent among women^{23,24}. As all these studies are based on self-reports, the question on whether this is due to real gender difference or because of more openness among females when completing a questionnaire still remains un answered. The difference in TMJ/chewing muscles may be partly explained by more consumption of chewing gums among girls²⁵.

The children in our study preferred to respond to a face-questionnaire rather than to the VAS. It seems that having definite categories was more favourable to the children, whereas completing a VAS required some form of abstract thinking.

Our study faces a major limitation: the sample was small and highly selective and did neither represent the general population of children nor the general population of children who attend a dental clinic. Nevertheless, our findings shed some light on the poorly investigated issue of the relation between dental and somatic pain among children.

The results of our study suggest that children with dental pain suffer more often of stomachaches than children without dental pain. This may occur because these children are possibly more anxious about a potential treatment. In addition, younger children complain more about somatic pains. Firstborn children complain more about dental pain. The issue of children's expected sensation or reaction to future pain experience still needs to be investigated.

Children's pain and pain management must become a priority for all health care professionals. Health professionals must be trained in pain measurement and treatment techniques that are suitable for infants and children.

What this paper adds

• This study adds to understand some relations between dental and somatic pain complaints among children who attend a university pediatric dental clinic.

Why this paper is important to the paediatric dentist

- It is worthwhile to acquire self-reported information on somatic pain from children to understand their current dental pain.
- Younger children complain more about somatic pains.
- Firstborn children complain more about dental pain.

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