Journal of
Pediatric Dentistry
DOI: 10.14744/JPD.2021.06_36
J Pediatr Dent 2021;7(3):128-135

Original Article

Evaluation and Management of Dental Pain in Children Motivating Emergency Consultation at the Dental Consultation and Treatment Center of Casablanca

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Abstract

Objective: The objective of this study is to determine the causes, characteristics, treatment of dental pain that was the chief complaint and its evaluation in children aged 4 to 15 years old cared for at the dental consultation and treatment center of Casablanca.

Materials and Methods: This is a descriptive cross-sectional study of 150 children aged between 4- and 15- years old consulting and/or being cared for in the departments of emergency and pediatric dentistry of the Dental Consultation and Treatment Center of Casablanca.

Results: Dental pain was the chief complaint for 92.7% of the study population. 47.5% of the pain was of pulpal origin and 37.4% was related to an infectious complication. 83.8% of patients aged 4 to 6 years required management, while only 48% of patients aged 6 to 15 years had intense to very intense pain. In 61% of cases, this pain was managed by a dental procedure, compared with 35% who were managed by combining the dental procedure with a drug prescription and 4% by a drug prescription. Antibiotics alone or in combination were the most frequently prescribed medication in 35.8% of cases. Dental pain was managed by dental extractions in 46.8% of cases, pulp treatment in 30.2% of cases, and cavity curettage in 7.9% of cases.

Conclusion: Dental pain is one of the most dreaded pains, seen, its intensity, frequency, complications and impact on the child's daily activities. This requires its diagnosis, evaluation, and relief to improve the quality of life of young patients.

Keywords: Evaluation, management, pain, pediatric dentistry

Introduction

Pain has been defined by the International Association for the Study of Pain (IASP) as an unpleasant emotional and sensory experience associated with actual or potential tissue damage or described by the patient in such terms. This definition described in 1988 implies sufficient cognitive development to locate and identify this experience but also to communicate it.[1]

Pain includes physiological, sensory, emotional, behavioral, cognitive, and socio-cultural components. Factors that are cited as being involved in the experi-

How to cite this article: Mtalsi M, Elasmar M, Zenouaki M, Hamza M, Aljalil Z, Elarabi S. Evaluation and Management of Dental Pain in Children Motivating Emergency Consultation at the Dental Consultation and Treatment Center of Casablanca. J Pediatr Dent 2021;7(3):128-135

ence of pain include: age, character of the child, cultural factors, type of pain, and previous experiences, which give rise to the notion of painful memory in children, which in the short and medium term leads to pain awareness, anxiety, and in the longer term to phobia or avoidance of care.[2,3]

The absence or the inadequacy of language and comprehension in children reinforces and amplifies painful perception. Nociceptive events (isolated or repeated) can lead to considerable stress reactions, with anticipatory behaviors likely to increase pain perception.[4]

Pain is a subjective perception and its treatment therefore requires its evaluation. This indispensable and compulsory preliminary time allows a quantified and reproducible measurement to be obtained, which is the basis for adapting the analgesic treatment.[1]

Although there is no specific biological or physiological marker for pain, it can be assessed using validated scales that are sensitive, reproducible and specific. Pain intensity is assessed using tools adapted to the child's age and general condition.[1]

After evaluation, pain management is essential. It may be psycho-behavioral, medication or surgery, and is aimed at allowing the child to return to basic activities (moving, playing, sleeping, talking and eating).[1]

Dental pain is one of the most dreaded pains because of its intensity, frequency, complications and impact on daily activities. It therefore requires an etiological diagnosis, evaluation and adapted management.

The objective of this study was to determine the causes and characteristics of dental pain, which is the chief complaint, and to assess its intensity and its management in children aged between 4 and 15 years.

Materials and Methods

This cross-sectional study covered children aged 4 to 15 years consulting the dental emergency service and the pediatric dentistry service of the Casablanca Dental Consultation and Treatment Center and whose care was carried out at the same center by students of the 5th year of medicine dentistry. The study was conducted between December 2014 and February 2015. Disabled patients and patients whose careers did not agree to participate were excluded from this study.

Collecting data was achieved using a questionnaire containing five parts:

The first part has defined patients according to age (from 4 to 6 years and from 6 to 15 years), sex, socio-economic status, child's general condition, current medication and chief complaint (presence or absence of pain).

The second part evaluates the child's behavior according to the VENHAM scale modified by Veerkamp[5] at 4 points in the child's care: at the first contact, during the interview with the parents, at the installation in the chair and at the dental examination.

The characteristics and causes of pain were described in the third part. The pain characteristics are location, appearance, type (spontaneous or provoked), triggering factors (mastication, exposure to cold, exposure to heat, or other aggravating factors), and pre-consultation relief factors (application of heat, taking medication, or other). As for the etiology of the pain, it has been divided, according to its origin, into mucosal, gingival, dental, infectious, septal syndrome, dental trauma or periodontal pain.

With reference to the recommendations of the National Agency Accreditation and Health Assessment (ANAES)[6], we had assessed in the fourth part the pain intensity of patients according to their age as follows:

In patients aged between 4 and 6 years, a self-evaluation was first attempted using a double-sided slide rule with a slider that the child dragged according to the pain intensity. This slider has the Visual analogue Scale (VAS) on one side and the Wong-Baker Face Pain Rating Scale (WBFPS) on the other side. Thus, its use made it possible to obtain two scores which will be compared initially and supplemented by a hetero-evaluation in the event of a discrepancy between the results of the VAS and the WBFPS.

For the hetero-assessment, the modified Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) was used to determine the threshold for therapeutic intervention, which is set at 9/13.[6]

In patients aged 6 to 15 years and still according to the ANAES recommendations [6], a self-assessment was considered sufficient using the Visual Analogue Scale (VAS).

While the last part gives information on the dental pain management, which can be a drug prescription, a treatment by an operative procedure or a combination.

Informed consent was signed by the careers of each patient after explaining the purpose of the study, its objectives and benefits.

The exploitation and analysis of the results were carried out using the EPI 6 software (Epi Info version 6).

Results

A total of 150 patients were included in the present study. The distribution by age, sex and socio-economic level is described in Table 1.

Table 1. Distribution of the study population by age, sex and socioeconomic status

	n	%
Age (years)		
[4-6] years	46	30.7
[6-15] years	104	69.3
Sex		
Female	64	42.7
Male	86	57.3
Socio-economic status		
Low	83	55.3
Medium	59	39.3
High	8	5.3

The questionnaire completed by the patients' companions has revealed that 83.3% of the children undergoing the study were in good health, 16.7% suffered from a general pathology, and 10% were taking medical treatment.

Pain was the chief complaint of 139 patients examined, representing 92.7% of the consulting population and 11 patients (7.3%) presented for a comprehensive dental check-up without any notion of pain.

Table 2 summarizes the child's behavior during the different phases of care.

When assessing behavior at first contact, 12% of patients were tenses, this rate increased to 24.7% at interview and 32.7% while being seated in the dental chair. During the dental examination, the rate of tense patients decreased to 24% (Fig. 1).

The anamnesis associated with the clinical examination allowed to identify the different characteristics of the pain: location, appearance, type, aggravating and relieving factors. Thus, 85.6% of the pain felt was localized, 54.0% was acute pain and 66.9% was spontaneous. 24.5% of patients reported that their pain was exacerbated by mastication, 51.8% by mastication and cold.

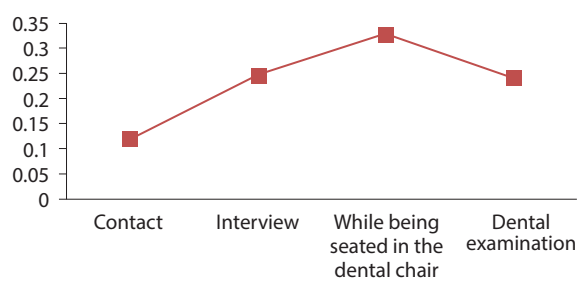

Figure 1. Progression of the "tense" behavior of patients during the different phases of treatment

Table 2. Child's behavior during the different phases of care according to the VENHAM scale modified by Veerkamp

Phases of care	n	%
1st contact		
Relaxed	78	52.0
Uncomfortable	52	34.7
Tense	18	12.0
Reluctant	0	0
Highly disturbed	2	1.3
Totally disconnected	0	0
Interview		
Relaxed	66	44.0
Uncomfortable	45	30.0
Tense	37	24.7
Reluctant	2	1.3
Highly disturbed	0	0
Totally disconnected	0	0
While being seated in the dental chair		
Relaxed	67	44.7
Uncomfortable	24	16.0
Tense	49	32.7
Reluctant	9	6.0
Highly disturbed	1	0.7
Totally disconnected	0	0
Dental examination		
Relaxed	54	36.0
Uncomfortable	27	18.0
Tense	36	24.0
Reluctant	28	18.7
Highly disturbed	4	2.7
Totally disconnected	1	0.7

In 30.9% of the cases, pain relief before the consultation was mainly obtained by analgesic medication, 21.6% of the patients were relieved by other methods such as the use of warm saline solution, clove powder, application of nail polish).

Dental caries was the most dominant etiology with a percentage of 47.5% followed by infectious origin in 37.4% of cases. While traumatic origin was involved in only 12.2% of the study population (Table 3).

Intensity of pain in children aged 4 to 6 years was assessed using two scales. According to the VAS, 53.6% of the young patients had qualified their pain as intense to very intense against 72.1% according to the WBFPS scale (Table 4).

After comparing the results obtained by the two scales, there was a 30.2% discrepancy between the

results obtained and therefore only the results of the hetero-evaluation according to the CHEOPS scale were retained (Table 5). According to the latter scale, 83.8% of patients had pain requiring therapeutic intervention according to ANAES recommendations.[6]

The evaluation of pain in patients aged 6 to 15 years showed that 48% of patients rated their pain as intense to very intense and 26.1% rated it as mild (Table 6).

The pain management was varied according to its etiology. It was relieved by performing an operative procedure in 61% of patients, compared to 35% who were managed by combining the operative procedure with a drug prescription and 4% by a drug prescription.

In the present study, the drug prescription used antibiotics alone or in combination in 35.8% of cases and surgical procedures in 48.9 % (Table 7).

Table 3. Characteristics and origins of pain

	n	%
Location		
Localized	119	85.6
Radiating	20	14.4
Appearance		
Acute	75	54.0
Chronic	24	17.3
Recurrent	40	28.8
Type of pain		
Spontaneous	93	66.9
Triggered	46	33.1
Factors aggravating the pain		
Mastication	34	24.5
Cold	8	5.8
Heat	2	1.4
Mastication+cold stimulus	72	51.8
Cold stimulus+mastication+heat stimulus	14	10.1
Mastication+heat stimulus	1	0.7
Others	1	0.7
No aggravating factors	7	5.0
Means of relief before consultation:		
Application of heat	2	1.5
Analgesics	43	30.9
Other means of relief	30	21.6
No relief	64	46.0
Origin		
Dental	66	47.5
Infectious complication	51	37.4
Septum Syndrome	3	2.2
Mucosal	1	0.7
Gingival	1	0.7
Tooth fracture	11	8.1
Periodontal trauma	6	4.1

Table 4. Self-evaluation of pain in patients aged 4 to 6 years

	n	%
Visual analogue scale		
Light (1, 2, 3)	11	25.7
Moderate (4, 5)	9	20.9
Intense (6, 7)	5	11.7
Very intense (8, 9, 10)	18	41.9
WBFPS Scale		
Light (0, 2)	6	13.9
Moderate (4)	6	14.0
Intense (6)	6	14.0
Very intense (8, 10)	25	58.1

WBFPS: Wong-Baker Face Pain Rating Scale

Table 5. Hetero-evaluation of pain according to CHEOPS scale in patients aged 4 to 6 years

CHEOPS	n	%
4	1	2.3
5	1	2.3
6	3	7.0
7	1	2.3
8	1	2.3
9	19	44.2
10	7	16.3
11	2	4.7
12	3	7.0
13	5	11.6

CHEOPS: Children's Hospital of Eastern Ontario Pain Scale

Table 6. Self-evaluation of pain according to VAS in patients aged 6 to 15 years

Visual analogue scale	n	%
Light (1, 2, 3)	25	26.1
Moderate (4, 5)	25	26.1
Intense (6, 7)	20	20.9
Very intense (8, 9, 10)	26	27.1

Discussion

Dental pain is the main chief complaint in hospital dental emergency departments. In fact, it was the chief complaint of 92.7% of the population studied in the present

Table 7. Pain management

	n	%
Drug prescription		
Antibiotic alone or in combination	50	35.8
Antiseptic	1	0.7
Analgesics	1	0.7
No drug prescription	87	62.6
Operative procedure		
Dentin curettage	11	7.9
Redoing the restoration	2	1.4
Dental pulp treatment	42	30.2
Treatment of septum pathology	2	1.4
Surgical procedure	68	48.9
Treatment of trauma	9	6.4
Treatment not involving operative procedure	5	3.59

study, which is in line with the results reported by Masson and al. in a study of 155 children which showed that dental pain was the chief complaint of 83%.[7]

In the study of LC Martens and al (2018)[8], the majority (96.7%) of patients reported pain, with 16.3% of patients not necessarily requiring immediate care. According to this study, children in the 6 to 15 age group are those who consult the most, with a percentage of 69.3%.

These results are consistent with the findings of RS Naidu and al[9] in the West Indies (2005), and LC Martens [8] in Belgium (2018) who showed that the dental emergency service is mainly used by children with mixed dentition. However, in the United States[10] and the United Kingdom[11], the average age of children consulting was lower, at 5 years.

This delay in consultation observed in certain populations can be explained by the fear and anxiety of the dentist in patients overall; however, in very young children in particularly. Difficulties in pain expression, communication and also the structural, the anatomical and the histo-physiological characteristics of temporary teeth make the appearance of pain related to pulpitis rare. Moreover, some parents are not conscious of the importance of treating oral pathologies and pain related to temporary teeth.

The socio-economic level of the study population was considered low by 55.3% and medium by 39%. These results are similar to those found in other studies[12-14] which found a strong correlation between low socio-economic status and high rates of dental pain.

In fact, access to health care structures is reduced for patients from a low socio-economic level because of the unequal distribution of health structures, the lack of dental care equipment in some facilities and secondary health centers and their high cost in private structures.[12]

Behavioral evaluation in the study population showed that anxiety was increased at the clinical interview and at dental chairside seating, respectively. This can be explained according to the study by MUPPA and al[15] by the hospital environment, waiting time, unusual sounds from the treatment room, fear of the unknown (instruments, odors....). This feeds the young patient's apprehension. However, the "tense" behavior of the patients has clearly improved between the installation in the dental chair and the dental examination. This improvement is probably due to the effectiveness of the different methods of psychological approach adopted by the practitioners. These results are consistent with Peretz's study of 104 young adolescent patients where he found that anxiety decreased at the installation in the dental chair time.[16]

Dental origin, dental caries with and without pulpal involvement, was the dominant etiology of pain with a percentage of 47.5% followed by infectious origin (dental abscess, cellulitis) in 37.4% of cases. The traumatic origin was involved in only 12.2% of the population studied.

Similar results were reported by LC Martens and al[8] and RS Naidu and al[9] who found that dental pain due to dental caries and its consequences were the most frequent emergency, followed by dental trauma.

However, the study by Chia-Pei Jung and al in 2016[17] showed that dental trauma was the most common cause of emergency care (47.1%), followed by dental pain due to tooth decay and its consequences.

This high frequency of dental caries emergencies could be partly explained by the high prevalence of caries in Morocco. Indeed, according to the latest epidemiological data (2012)[18], 81.8% of 12-year-old children and 86.67% of 15-year-old adolescents had caries in permanent dentition.

Dental pain is an emergency that motivating consultation for several reasons: Some dental pain is not relieved by analgesics or wears off temporarily which requires relief through a dental procedure. Infectious complications are often frightening on a local or general level (bacteremia, infectious endocarditis...). These pains negatively influence the quality of life and disrupt the young patient's basic activities (eating, sleeping, playing, reading....) and can even compromise the quality of life of the parents.[11,13]

In 30.9% of cases, dental pain relief was mainly obtained by self-medication with analgesics and in

21.6% by other methods (warm saline solution, clove powder, nail polish application).

Other studies evaluating methods of early pain management revealed that self-medication with analgesics and anti-inflammatory drugs were the most commonly used, with rates of 74% [7] and 69.8%.[19] These results are much higher than those found in the present study. This difference can be explained by the socio-cultural and economic differences in the populations studied that manage dental pain differently in children and young adolescents.[19]

Difficulties in accessing the public health care system and the high costs of health insurance and medical consultations also contributed to the spread of the practice of self-medication. On the other hand, the anxiety and fear of visiting the dentist encountered in young patients may also be an argument for self-medication.[19]

The study by Thikkurissy and al (2012) in 300 parents of children with dental pain found that 76% of them self-medicated with at least one dose of over-the-counter analgesics.[20]

Similarly, analgesics were described as the main drugs used for self-medication in this study, which may be related to their wide availability and low cost. These medications may provide temporary relief of toothache or other discomfort reported by children.[19]

Difficulty in identifying and assessing pain in children is one of the barriers to its management. Pain is best managed when it is initially assessed and when treatment is regularly reassessed.[6]

The use of pain evaluation tools is generally necessary to confirm the existence of pain, assess its intensity, determine the analgesic means required, and evaluate the effectiveness of the treatment instituted.[6]

These evaluation tools differ according to the age of the child. For children aged 4 to 6, self-evaluation can be attempted as it helps to strengthen and foster the partnership with the child. In fact, it should be favored as long as possible because pain is defined as a subjective experience that can only be well judged by the person who feels it.[21,22]

According to the ANAES recommendations [6], pain evaluation in children aged 4 to 6 years is initially done by self-evaluation using the VAS in conjunction with another self-evaluation tool. A systematic review of the literature on face scales (Self-evaluation scale) concluded that children preferred the WBFPS scale because the faces used are close to those of children, which further promotes their cooperation.[23] On the other hand, a correlation between the WBFPS scores and the VAS was found by Garra and al.[24]

At the end of the self-evaluation, the results of the 2 scales used (VAS) and (WBFPS) are compared. Then a hetero-evaluation was necessary.

The hetero-evaluation was conducted by the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) which is the most widely used scale in young children today to objectify acute pain. Based on a systematic review of observational pain evaluation tools, the authors concluded that the CHEOPS scale has an Evidence Level I, indicated for children aged 1 to 7 years. Thus, it is a widely used and recommended scale for the evaluation of pain associated with medical procedures.[25] In this study, this scale was slightly modified and adapted for use in dentistry by replacing the term wound with tooth.

Whichever method of evaluation is chosen (self-evaluation or hetero-evaluation), it will make it possible to assess the intensity of the pain, and to determine the threshold for therapeutic intervention, which is set on the basis of: 3 /10 for VAS, 4/10 for WBFPS and 9/13 for CHEOPS.[6]

The evaluation of pain that was a chief complaint in the present study, in children aged 4 to 6 years, showed a strong divergence (30.2%) between the results of the two scales used (VAS and WBFPS). This discrepancy can be explained on the one hand by the tendency of young patients to use the end of the face scales (WBFPS) with the choice of the face with tears, and on the other hand by the difficulty in mastering the self-evaluation scales by the young child and the influence of the scores chosen by the anxiety felt by the child.

As a result of this discrepancy in results, only the results of the hetero-evaluation of pain using the Children's Hospital of Eastern Ontario Pain Scale (CHEOPS) were retained: 83.8% of patients had pain requiring therapeutic intervention.

For children aged 6 to 15 years, the self-evaluation showed excellent metrological qualities in dentistry. It can therefore be used with confidence provided that the explanation is appropriate to the child's level of understanding. Our choice was based on the VAS, which has the advantage of being a well-established, validated, and sensitive scale that is easy to use and the calculation of scores is simplified by the presence of figures that make it possible to quantify the intensity of pain, thus avoiding the bias associated with an imprecise description of pain intensity.[6]

The results of pain evaluation in children aged 6 to 15 years showed that pain was rated as severe to very severe in 48% of patients, moderate in 26.1%, and mild in 26.1% based on the VAS scale. These results are

slightly higher than those found in Brazil, where dental pain in children aged 8 to 9 years was rated as intense to very intense in 39.0% of the sample.[26] However, it is interesting to note that for this study another scale (VASOF) which is an association of VAS and the face scale was used.

Dental pain was relieved in the present study by performing a dental procedure in 61% of patients and in 35% by a dental procedure associated with a drug prescription. The results related to relief by a pulpal procedure (30.2%) are close to those found in the Geovanna study (25.6%),[27] in contrast to extractions (46.8%), where the results in the present study are much higher than those reported by Geovanna[27] (5.8%) and Tulip[28] (12.4%). This difference can be explained by the late consultation in our population.

The use of prescription drugs (whether associated with the dental procedure or not) was 37.2%. The results obtained are similar to those found by Geovanna[27] in 2014 and Chia-Pei in 2016[17], where the management of dental pain in children was mainly by drug prescription with a percentage of 40.5% and 52.7% respectively. As for the study by Tulip and al[28], it concluded that drug management for dental emergencies in children was mainly by antibiotic prescription with a rate of 39%, which is similar to the results obtained in the present study where antibiotics were prescribed in 35.8% of patients.

In general, clinical practice, lack of time and uncertainty about the correct diagnosis may be the main reasons for prescribing antibiotics for dental pain.[27]

Antibiotics must be given as a supplement to the definitive treatment because they only treat the symptoms of infections caused by dental caries lesions. In the case of inflammation or necrosis of the dental pulp, an oral clinical intervention is fundamental to relieve pain. It is not adequate to prescribe systemic drugs, especially antibiotics alone. Inappropriate prescribing of antibiotics and analgesics in emergency departments can trigger allergic or toxic reactions in addition to the possibility of promoting antibiotic resistance or intolerance.[27]

Conclusion

Dental pain is one of the most dreaded pains, seen, its intensity, frequency, complications and impact on the child's daily activities. This requires its diagnosis, evaluation, and relief to improve the quality of life of young patients.

During his daily activity, the practitioner should be able to recognize the pain in young patients and act to reduce their anxiety by psychological approach, a positive relationship of confidence between patient and practitioner and must master recent means of diagnosis and management of pain in children, whether it be pharmacological, operative, or anesthetic.

Financial Disclosure: Nil.
Conflict of Interest: None declared.

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