

Dental Pain Season in a Pediatric Dental Clinic Makkah, Saudi Arabia

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ABSTRACT

Objective: Dental pain is the most common reason for dental visits among children in many regions in the world. The weather changes can change the health lifestyle by increasing drinking cold drinks which may cause dental hypersensitivity or misdiagnosed dental pulpitis due to the limited ability to describe the dental pain by the children. Most children cannot observe the decay in the early stage and they need indeed their parent to guide them in a healthy lifestyle.

Subject and Methods: Data were collected retrospectively of 600 children from the dental records of new pediatric patients attending a clinic. The collected data included all months in 2022. The frequency of each invasive procedure in each month was calculated as well the gender and other demographic variables.

Aim: To determine the highest frequency of dental pain attenders among children under 14 years old during the four seasons of 2022 and using these results to enhance our health services to design future plans.

Result: The highest frequency of dental pain cases was in summer (84%) and the lowest was in Spring (16%).

Conclusion: This study could be the first study aiming to investigate the dental pain patients flow regarding the four seasons. It has been done in Makkah in which the weather temperature can reach 50 degrees in the summer. Further studies with the same aim in a different weather

condition are needed to compare our results and enhance our health services in the future.

Conclusion: Dental pain season is in the summer in our paediatric dental clinic. The high frequency of dental pain cases during the summer could be a result of the health lifestyle related to the hot weather.

Keywords: Dental pain season, paediatric dental clinic, Makkah

INTRODUCTION

One of the interested topics to the paediatric dentists and the health providing managers is the “dental pain season” which give them an expected imagination to know which month in the year could has a high frequency of dental pain cases. Low water intake and highly sugar intake in the summer may lead to exaggerate the dental problems which depends directly to the behaviours and the lifestyle. Dental pain can be triggered by differential temperature. Repeated exposure to significant positive temperature gradients (from cold to warm) generates phenotypic changes of dental primary afferents on selected teeth with subsequent development of a “low-grade” neurogenic inflammation (J Pain Res. 2017). There is no previous study investigated the frequency of dental pain regarding to the year season. The weather can influence the health lifestyle and the dental health as well. The factors of positive and

negative dental attendance in Paediatric Dental Clinic were carefully studied in previous studies. Some of these factors related to the patient and some of them related to the dental services providers. Dental attendance is very important to be investigated in each dental clinic individually to enhance the equality of the services and for the related economic issues. The dental visits range from examination, prevention, early detection, treatment and preservation. The dental pain is one of many reasons of dental visits but not the single reason. Many parents have an unrealistic optimism which means that the parent think that their child's dental status is good so far that no dental pain. In the other side, there is a realistic optimism which means that the parents try to visit the paediatric dentist regularly for check-ups and share their children in many preventive activities such as good teeth brushing and reading or showing dental instructions that remodelling the child's dental behaviours to (Alsaedi et. al. 2016). Other studies conducted in Saudi Arabia have also documented late exposure to dental care, with considerable percentages of parents reporting that they did not see the need for dental visitation if their children were not in pain (Al-Shalan, 2003; Al-Shalan et al., 2002; Wyne and Khan, 1998). In a previous study that has been done in Department of Pediatric Dentistry and Orthodontics, College of Dentistry, King Saud University, Riyadh, Saudi Arabia, dental pain was the dominant factor (71.5%) bringing children to their first dental visits (Murshid et. al. 2015). This study is the first study that investigate the dental pain patients flow during the four seasons of 2022 in Makkah in Saudi Arabia and a reference for the studies that could be in the future with same aim.

MATERIAL AND METHOD

This retrospective study has been done by using the data of 600 children who attended in our paediatric dental clinic during the last twelve months from January 2022 to December 2022. The data was collected from the patient's files which include the chief

compliant of the dental visit. In addition to that, the gender and the age were written to assess the demographic frequency. The selected age group of children was under 14 years old. All data were collected in an excel sheet with columns included the count, reason of the visit, age, gender, month of the visit and the achieved procedure, then converted to SPSS for data analysis.

RESULT

Table 1: Age in years

Age in years	Frequency	Percent
5	71	11.8
6	103	17.1
7	47	7.8
8	90	15.0
9	100	16.6
10	42	7.0
11	18	3.0
12	29	4.8
13	67	11.1
14	34	5.7
Total	601	100.0

Frequency of ages showed that the highest frequency is age 6 with 17%, followed by age of 9 years (16.6%), followed by age of 8 years (15%)

Table 2: Type of procedure used

procedure	Frequency	Percent
pulpotomy	207	34.4
filling	248	41.3
extraction	146	24.3
Total	601	100.0

About 41% of children were treated by filling, 34% pulpotomy and 24% for extraction

Table 3: Treatment according to month

month	Frequency	Percent
January	50	8.3
February	51	8.5
March	50	8.3
April	50	8.3
May	50	8.3
June	50	8.3
July	50	8.3
August	50	8.3
September	50	8.3
October	50	8.3
November	50	8.3
December	50	8.3
Total	601	100.0

In each month there were 50 (8.3%) patients attended the clinic

Table 4: Treatment according to gender

gender	Frequency	Percent
Male	318	52.9
Female	283	47.1
Total	601	100.0

Males were represented by 53% while females were 47%.

Table 5: Chi square test to compare between age and procedure

			procedure			Total	P value
			pulpotomy	filling	extraction		
age	5	Count	27	25	19	71	0.93
		% within age	38.0%	35.2%	26.8%	100.0%	
		% within procedure	13.0%	10.1%	13.0%	11.8%	
		% of Total	4.5%	4.2%	3.2%	11.8%	
	6	Count	38	44	21	103	
		% within age	36.9%	42.7%	20.4%	100.0%	
		% within procedure	18.4%	17.7%	14.4%	17.1%	
		% of Total	6.3%	7.3%	3.5%	17.1%	
	7	Count	12	19	16	47	
		% within age	25.5%	40.4%	34.0%	100.0%	
		% within procedure	5.8%	7.7%	11.0%	7.8%	
		% of Total	2.0%	3.2%	2.7%	7.8%	
	8	Count	33	35	22	90	
		% within age	36.7%	38.9%	24.4%	100.0%	
		% within procedure	15.9%	14.1%	15.1%	15.0%	
		% of Total	5.5%	5.8%	3.7%	15.0%	
	9	Count	37	41	22	100	
		% within age	37.0%	41.0%	22.0%	100.0%	
		% within procedure	17.9%	16.5%	15.1%	16.6%	
		% of Total	6.2%	6.8%	3.7%	16.6%	
	10	Count	12	21	9	42	
		% within age	28.6%	50.0%	21.4%	100.0%	
		% within procedure	5.8%	8.5%	6.2%	7.0%	
		% of Total	2.0%	3.5%	1.5%	7.0%	
	11	Count	7	5	6	18	
		% within age	38.9%	27.8%	33.3%	100.0%	
		% within procedure	3.4%	2.0%	4.1%	3.0%	
		% of Total	1.2%	.8%	1.0%	3.0%	
	12	Count	10	13	6	29	
		% within age	34.5%	44.8%	20.7%	100.0%	
		% within procedure	4.8%	5.2%	4.1%	4.8%	
		% of Total	1.7%	2.2%	1.0%	4.8%	
	13	Count	22	30	15	67	
		% within age	32.8%	44.8%	22.4%	100.0%	
		% within procedure	10.6%	12.1%	10.3%	11.1%	
		% of Total	3.7%	5.0%	2.5%	11.1%	
	14	Count	9	15	10	34	
		% within age	26.5%	44.1%	29.4%	100.0%	
		% within procedure	4.3%	6.0%	6.8%	5.7%	
		% of Total	1.5%	2.5%	1.7%	5.7%	
Total	Count	207	248	146	601		
	% within age	34.4%	41.3%	24.3%	100.0%		
	% within procedure	100.0%	100.0%	100.0%	100.0%		
	% of Total	34.4%	41.3%	24.3%	100.0%		

There was no statistical association between age and procedure, p value > 0.05

Table 6: Chi square test to compare between status and procedure

			procedure			Total	P value
			pulpotomy	filling	extraction		
status	Emergency	Count	206	1	145	352	0.00
		% within status	58.5%	.3%	41.2%	100.0%	
		% within procedure	99.5%	.4%	100.0%	58.7%	
		% of Total	34.3%	.2%	24.2%	58.7%	
	Non-Emergency	Count	1	247	0	248	
		% within status	.4%	99.6%	.0%	100.0%	
		% within procedure	.5%	99.6%	.0%	41.3%	
		% of Total	.2%	41.2%	.0%	41.3%	
	Total	Count	207	248	145	600	
		% within status	34.5%	41.3%	24.2%	100.0%	
% within procedure		100.0%	100.0%	100.0%	100.0%		
% of Total		34.5%	41.3%	24.2%	100.0%		

There was statistical association between status and procedure, p value < 0.05

Table 7: Chi square test to compare between month and procedure

			procedure			Total	P value
			pulpotomy	filling	extraction		
month	1	Count	12	31	7	50	0.00
		% within month	24.0%	62.0%	14.0%	100.0%	
		% within procedure	5.8%	12.5%	4.8%	8.3%	
		% of Total	2.0%	5.2%	1.2%	8.3%	
	2	Count	12	29	10	51	
		% within month	23.5%	56.9%	19.6%	100.0%	
		% within procedure	5.8%	11.7%	6.8%	8.5%	
		% of Total	2.0%	4.8%	1.7%	8.5%	
	3	Count	14	26	10	50	
		% within month	28.0%	52.0%	20.0%	100.0%	
		% within procedure	6.8%	10.5%	6.8%	8.3%	
		% of Total	2.3%	4.3%	1.7%	8.3%	
	4	Count	11	33	6	50	
		% within month	22.0%	66.0%	12.0%	100.0%	
		% within procedure	5.3%	13.3%	4.1%	8.3%	
		% of Total	1.8%	5.5%	1.0%	8.3%	
	5	Count	16	24	10	50	
		% within month	32.0%	48.0%	20.0%	100.0%	
		% within procedure	7.7%	9.7%	6.8%	8.3%	
		% of Total	2.7%	4.0%	1.7%	8.3%	
	6	Count	20	17	13	50	
		% within month	40.0%	34.0%	26.0%	100.0%	
		% within procedure	9.7%	6.9%	8.9%	8.3%	
		% of Total	3.3%	2.8%	2.2%	8.3%	
	7	Count	24	11	15	50	
		% within month	48.0%	22.0%	30.0%	100.0%	
		% within procedure	11.6%	4.4%	10.3%	8.3%	
		% of Total	4.0%	1.8%	2.5%	8.3%	
	8	Count	29	8	13	50	
		% within month	58.0%	16.0%	26.0%	100.0%	
		% within procedure	14.0%	3.2%	8.9%	8.3%	
		% of Total	4.8%	1.3%	2.2%	8.3%	
	9	Count	17	13	20	50	
		% within month	34.0%	26.0%	40.0%	100.0%	
		% within procedure	8.2%	5.2%	13.7%	8.3%	
		% of Total	2.8%	2.2%	3.3%	8.3%	
	10	Count	20	12	18	50	
		% within month	40.0%	24.0%	36.0%	100.0%	
		% within procedure	9.7%	4.8%	12.3%	8.3%	
		% of Total	3.3%	2.0%	3.0%	8.3%	
	11	Count	15	18	17	50	
		% within month	30.0%	36.0%	34.0%	100.0%	
		% within procedure	7.2%	7.3%	11.6%	8.3%	
		% of Total	2.5%	3.0%	2.8%	8.3%	
	12	Count	17	26	7	50	
		% within month	34.0%	52.0%	14.0%	100.0%	
		% within procedure	8.2%	10.5%	4.8%	8.3%	
		% of Total	2.8%	4.3%	1.2%	8.3%	
Total	Count	207	248	146	601		
	% within month	34.4%	41.3%	24.3%	100.0%		
	% within procedure	100.0%	100.0%	100.0%	100.0%		
	% of Total	34.4%	41.3%	24.3%	100.0%		

There was statistical association between month and procedure, p value < 0.05

Table 8: Chi square test to compare between gender and procedure

			procedure			Total	P value
			pulpotomy	filling	extraction		
gender	Male	Count	118	131	69	318	
		% within gender	37.1%	41.2%	21.7%	100.0%	
		% within procedure	57.0%	52.8%	47.3%	52.9%	
		% of Total	19.6%	21.8%	11.5%	52.9%	
	Female	Count	89	117	77	283	
		% within gender	31.4%	41.3%	27.2%	100.0%	
		% within procedure	43.0%	47.2%	52.7%	47.1%	
		% of Total	43.0%	47.2%	52.7%	47.1%	

	% of Total	14.8%	19.5%	12.8%	47.1%	0.19
Total	Count	207	248	146	601	
	% within gender	34.4%	41.3%	24.3%	100.0%	
	% within procedure	100.0%	100.0%	100.0%	100.0%	
	% of Total	34.4%	41.3%	24.3%	100.0%	

There was no statistical association between gender and procedure, p value > 0.05

DISCUSSION

Dental pain in winter was observed in many previous studies (The explanation behind the dental pain in winter was discussed).

The sensory A fibers of the pulp responses to natural health changes such as cold and hot drinks. Highly consuming of cold drinks in summer may evokes the dental sensitivity. The temperature in summer normally above 35 degree and in some cities in Saudi Arabia may reach 40 degrees. We suggested that the reason behind the high frequency of the emergency dental pain cases in summer is the highly intake of cold drinks. The sensitivity to temperature is often caused by factors such as thin or weakened enamel, cracks and microscopic fractures in the tooth, gum shrinkage, fillings and crowns that have been eroded over time.

Regarding to the ability limitation of children to describe the dental pain for their parent and their paediatric dentist, misdiagnosis can be happened between the dentin sensitivity and pulpitis. The dental anxiety may increase this misdiagnosis because many of anxious children refused some diagnostic tools. The professional paediatric dentist can determine the correct diagnosis clinically.

Regarding to the result of age distribution in this study, we observed that the majority of the attenders in the dental clinic were above 5 years old. We said the majority because the inclusion criteria in the current study did not cover all the dental procedure that can be done for the young patient such as fluoride application or simple caries debridement, the younger children than 5 years old attended indeed in the paediatric dental clinic but for other procedure. Some of these procedures related to design individual prevention program for each young child who in high risk of dental caries.

According to the result, the majority of dental emergency cases were in the summer (84%). We suggested the reason behind this high number of dental pain cases in summer due to the child health lifestyle related to this season. The weather in summer is very hot and the temperature could reach 50 degrees in some cities. The cold drinks in this hot weather can make some changes regarding to dental pulp reaction. Repeated exposure to significant positive temperature gradients (from cold to warm) generates phenotypic changes of dental primary afferents on selected teeth with subsequent development of a “low-grade” neurogenic inflammation. As known, the children cannot explain exactly what they feel. This can exaggerate the parent anxiety specially the over-protective parents. Additionally, Dehydration can be a factor of dental pain due to the risk of dental caries in case dehydration. In the summer, the body secretes more sweats and low saliva. This will increase risk of dental caries incidence and the dental hypersensitivity. One of the instructions that could help to avoid dehydration is high amount water drinking. This behaviour during the summer should be under parent’s supervision. The control over the child’s lifestyle during summer is an important task that the parent should not ignore. In Spring 2022, the result showed that the lowest number of dental pain attenders was in April. In Spring, the health lifestyle could be different than in summer. The temperature in spring normally not exceeds 35 degrees.

It is expected result of low dental pain attenders in this time of years because the majority of children in vacations tend to travel with their parents. This suggested reason is supported with the many previous researches focused on the dental attenders and the behaviour of the patients regarding to the first visit and the follow-up visits later. They focused also on the factors that affected

the dental attending positively or negatively. These factors could be regarding to the patient's side or to the health care provider's side. We did not find any research from these previous studies that studied the dental pain in the year seasons. The importance of knowing the dental pain season can help the dental clinics in their economic and quality managements. Patient's flow can be investigated like in this study to investigate which procedure is a trend in each month in the year and thus; prepare the team and the dental unit to cover this high number of a specific procedure in a specific time. A copy from these results was taken by our management team to design a new plan of the provided services in the future. More investigations in the other cities have to be done in the future and a comparison between these results from different cities can give us a clear vision regarding to dental pain season. Our result showed the high frequency of dental pain in the summer but this result cannot be applicable in some areas due to different lifestyle regarding to many factors. Additionally, if we think about the effect of the cold drinks in the summer on the dental hypersensitivity, we find logically that in the cold in the winter can make the same effect to those who are mouth breathers in that cold region. So, the stimuli are the sudden temperature changes regardless in which year season.

Conclusions And Recommendations

Further studies with the same aim in a different weather condition are needed to compare our results and enhance our health services in the future. We suggested to design other studies which include a specific method to recognize the type of the dental pain.

Declaration by Authors

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