PERCEPTION OF PAIN RESULTING FROM ORTHODONTIC SEPARATORS IN ORTHODONTIC PATIENTS VISITING DENTAL DEPARTMENT AT A PRIVATE HOSPITAL

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ABSTRACT

Pain is a response, which varies from one individual to another. Factors such as age, gender, magnitude of force applied, emotional status, individual pain threshold, etc., might affect pain. Patients who desire for orthodontic treatment are often afraid of having pain and discomfort during various stages of orthodontic treatment. This has become one of the most commonly reported complaint and reason for discontinuing orthodontic treatment. This study aims at examining the intensity of pain in orthodontic patients' experience following the insertion of separators attending Department of Orthodontics in Nepal Medical College. Eighty six patients (26 males and 60 females) who came to department of orthodontics for fixed orthodontic treatment were selected with age range of 15-26 years. Elastomeric separators were placed mesially and distally to the upper and lower first permanent molars in all patients. Following placement of separator, the patients were given self-administrated questionnaires and they were properly instructed on how to answer the questions. Descriptive statistics of different factors for pain perception were assessed using SPSS 16. Most of the patients had pain on second day of separator placement and among them females experienced more pain than males. Then pain slowly decreased after day 3 and disappeared after day 5. More females experienced continuous type of pain and took analgesics compared to males. Results showed that pain began a few hours after application of orthodontic force and lasted for around 5 days. Most of the patients reported pain during eating and chewing on second day and had to change their food habits into softer one. Younger age group patients experienced more pain compared to older age groups.

KEYWORDS

Analgesics, Orthodontic pain, separators

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INTRODUCTION

Patients who desire orthodontic treatment are often afraid of having pain and discomfort during various stages of orthodontic treatment. This is one of the major concerns for both patients as well as clinicians.[1] According to International Association for the study of pain (IASP), pain is an unpleasant sensory and emotional experience that changes person's behavior hindering normal performance of their daily activities.[2] Factors such as age, gender, magnitude of force applied, emotional status, individual pain threshold, etc., might affect pain.[3,4] Approximately 90% of the orthodontic patients report pain during orthodontic treatment, which has become one of the most commonly reported complaint and reason for discontinuing orthodontic treatment.[5]

Studies have reported that 28% of orthodontic patients consider discontinuing treatment due to fear of pain, while 39% of them claim that pain is the worst feature of orthodontic appliances.[6,7,8]

Study,[9] shows that motivation to seek orthodontic treatment can affect the way patients report pain during orthodontic treatment. It was found that the separators placed caused high level of pain and discomfort at 4-24 hours of placement which was significantly reduced using analgesics.[1,10,11,12]

Some patients might experience a higher degree of pain in which use of pharmacological agents or nonpharmacological methods may be recommended for pain relief. As a pharmacological agent, the administration of nonsteroidal anti-inflammatory drugs (NSAIDs) has been proven to be the most effective pain-control technique,[10,11,12] As a nonpharmacological method, low-level laser therapy (LLLT) has recently been used.[6,7]

The aim of this study was to examine the intensity of pain experienced by the orthodontic patients following the insertion of separators.

MATERIALS AND METHODS

Eighty four patients (both male and female) who came to department of orthodontics for fixed orthodontic treatment from April 2017 to September 2017 were selected with age range of 15-26 years. Age group was divided as 15-18 years, 19-22 years and 22-26 years. Elastomeric separators were placed mesially and distally to the upper and lower first permanent molars in all patients.

The criteria for sample selection were: (1) all patients scheduled to have a fixed orthodontic treatment, (2) no proximal caries and restoration in the first and second permanent molars, (3) good gingival health. Following placement of separator, the patients were given questionnaires containing seven questions (Table 1) in the form of logbooks to take home, and they were properly instructed on how to answer the questions.1,5,11,13 Then the patients were recalled on sixth day of separator placement. Descriptive statistics of different factors for pain perception were assessed using the Statistical Package for Social Sciences for Windows version 16. Pearson Chi-square test was used to examine any significant differences between gender groups within the

Table 1: Questionnaire used among patients in a study evaluating pain from Orthodontic Separators.

Questions	First day	Second day	Third day	Fourth day	Fifth day
1. Have you got pain?	Yes No	Yes No	Yes No	Yes No	Yes No
2. What is the type of pain experienced?	a. Continuous b. Intermittent	a. Continuous b.Intermittent	a. Continuous b. Intermittent	a. Continuous b. Intermittent	a. Continuous b. Intermittent
3. Was it painful during eating/biting/chewing?	Yes No	Yes No	Yes No	Yes No	Yes No
4. Was it so painful that you have changed your food consistency to a finer food like banana, yoghurt etc.	Yes No	Yes No	Yes No	Yes No	Yes No
5. Was it so painful that your leisure activities influenced e.g. music, sports, time with fiends etc.?	yes No	Yes No	Yes No	Yes No	Yes No
6. Does the pain awaken you at night?	Yes No	Yes No	Yes No	Yes No	Yes No
7. Have you consumed any pain relief?	Yes No	Yes No	Yes No	Yes No	Yes No

studied sample. The significant difference level was set at the 5% level ($p<0.05$).

RESULTS

Out of 86 patients, 100% of them completed all questions until the fifth day with no loss of the separators. Out of 86 samples studied 69.8% were female 30.2% were male (Table 6). 91.9% patients had pain on first day of separator placement while 94.2% had pain on second day. 76.7% had pain on third day. Patients felt most painful and discomfort on second day which significantly decreased and pain was minimal by fifth day (Table 2).

More patients (50%) had continuous type of pain on first day while more patients (54.7%) had intermittent pain on second day. For first few days more patients had continuous type of pain which gradually became intermittent pain till fifth day. During eating or chewing, most patients had pain on second day compared to first and other five days which caused 59.3% of them to change their food habits to softer diet. The effect on their leisure activities significantly reduced after third day (Table 3).

Table 2: Presence of pain among patients at day one and day two (n=86)

Day 1			Day 2		
Pain	**Frequency**	**%**	**Pain**	**Frequency**	**%**
No	7	8.1	Yes	5	5.8
Yes	79	91.9	No	81	94.2
Total	86	100.0	Total	86	100.0

Only 7% had to wake up at night due to pain on first day. The pain of separators didn't affect the sleep of the patients that much. 37.2% had to take pain relief on first day. By fifth day the only 1.2% number of patients taking pain relief significantly reduced (Table 5). Out of 26 males 100% of males experienced pain during first day of separator placement while out of 60 females, only 88.3% had pain on first day. But on second day, 92.3% males had pain and 95% females had pain. Initially, males had more pain which was intermittent type but on the second day pain were less among males and more among females which was continuous type. (Table 6) This could be because males are more engaged in extracurricular activities than females so they often get distracted by those activities to remember pain and males are more stoical and can tolerate more pain.

More males (30.8%) males had pain during leisure activities than females (26.7%). But on second day, only 11.5% males and 23.3% females had pain during leisure activities. More females had to take pain relief. (Table5) No statistically significant differences were found between age groups and pain (Table7). Patients with age group 15-18 years (100%) experienced more pain than other age group. Statistically significant differences were found between age and type of pain felt during separator placement (Table7).

Table 3: Description of pain at day one among patients (n=86)

	Eating/Chewing/Biting		Change in food consistency due to pain		Pain during leisure activities		Pain during sleep	
Pain	**Frequency**	**percent**	**Frequency**	**Percent**	**Frequency**	**Percent**	**Frequency**	**Percent**
No	9	10.5	33	38.4	62	72.1	80	93.0
Yes	77	89.5	53	61.6	24	27.9	6	7.0
Total	86	100	86	100	86	100	86	100

Table 4: Types of pain at day one (n=86)

Pain	Frequency	Percent
No pain	7	8.1
Continuous pain	43	50.0
Intermittent pain	36	41.9
Total	86	100

Table 5: Intake of pain relief at day one (n=86)

Pain relief	Frequency	Percent
No	54	62.8
Yes	32	37.2
Total	86	100

DISCUSSION

This study was performed on 86 patients (26 male subjects, 60 female subjects) who were asked to fill up a questionnaire concerning pain after the insertion of elastomeric separators in molar areas. Pain was evaluated from the four hour after placement of elastomeric separators, and continued until the fifth day.

Table 6: Comparison of pain and types of pain between males and females (n=86)

Male (n=26)					Female n=60)					p-value
Pain		Types of pain			Pain		Types of pain			
Yes	No	No pain	Continuous	Intermittent	Yes	No	No pain	continuous	Intermittent	>0.05
26	0	0	12	14	53	7	7	31	22	

Table 7: Comparison of pain and type of pain by age group

Age group	Pain		p-value	Types of pain			p-value
	Yes	No		No pain	Continuous	Intermittent	
15-18	23	0	>0.05	0	8	15	<0.05
19-22	31	2		2	20	11	
23-26	24	5		5	15	9	

In many studies,[11,14] it has been reported that pain began a few hours after application of orthodontic force and lasted for around 5 days. In many studies, most of the patients reported continuous type of pain after 4 hours from separators placement, which continued to the second and third day. Similar results were found in this study following separator placement. Then, the pain became intermittent associated with significant decrease pain in the following days with least on the fifth day. Bondemark *et al*, Ngan *et al* and Shrestha R reported that the patients experienced severe pain at day 2 after placement of separator which is similar to this study.[3,14,15] Yamguchi *et al*. found that there was significant increase in the release of three major cytokines(IL-6, IL-8 and TNF-α) by human dental pulp cells after 12 hours of mechanical force application. The major neuropeptides as well as the pro-inflammatory cytokines might be involved in pulpal inflammation during orthodontic tooth movement.[21]

Most of the patients in the present study reported pain during eating and chewing, and due to pain they had to change their food habits into softer one and it was most painful during eating or chewing at day 2. Similar results were also found in other studies in which pain was mostly felt during eating or chewing which caused them to change their food consistency.[8,11]

Patients perception might be affected by various factors like age, sex, race, pain threshold level etc. This study reported higher degree of pain in males in first day but from second day females had more pain till fifth day similar to other studies done by Berguis *et al* and kafle and Rajbhandari in which females reported higher degree of pain during separator placement.[16,17] But in other studies, no significant gender differences were found regarding pain experienced during separator placement.[1,3,9,11,15]

It has been reported that orthodontic patients often use analgesics to control pain.[11] Out of 86 patients only 32 had to take analgesics for pain relief which is significantly low as compared to the study done by Goh.[5] This result is different from the other study,[18] in which consumption of analgesics was significantly high. It has been reported that orthodontic patients often use analgesics to control pain. The results showed that the highest consumption of analgesics was reported in the first day then decreased significantly in the following days.[11,19] Different researchers have suggested different methods of relieving pain during orthodontic treatment including the use of NSAIDs after application of orthodontic force to relieve pain,[15] use of pre-procedural analgesics one hour before separator placement Law *et al*,[20] Kafle and Rajbhandari,[17] the application of continuous wave low-level laser therapy,[6,7] etc. results in a significant decrease in pain on chewing 2 hours after the procedure.

In a study done by Brown and Moerenhout,[22] adolescents reported more pain than adult patients during all phases of orthodontic treatment which is similar to this study.

In conclusion, pain varies from one individual to another. Factors such as age, gender, magnitude of force applied, emotional status, individual pain threshold, etc, might affect pain. Results showed that ain began a few hours after application of orthodontic force and lasted for around 5 days. Most of the patients reported pain during eating and chewing on second day and had to change their food habits into softer one. Females experienced more pain than males but only few patients had to take analgesics for pain relief during the procedures. Younger age group patients experienced more pain compared to older age groups. Orthodontists play important role to explain the treatment procedures and do the proper counseling during separators placement. Patients should always be informed about the expected pain for two to three days of separator placement then pain will slowly subside after that. They should be encouraged to take analgesics if required and should be given proper

assurance that at the end of the treatment patient will have a beautiful smile which affects their esthetics, self esteem and confidence.

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