ORIGINAL ARTICLE

COMPARISON OF THE ANALGESIC EFFECTS OF FLURBIPROFEN WITH BITE WAFERS ON ORTHODONTIC PAIN

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ABSRACT

Pain following initial orthodontic fixed appliance therapy is an issue of concern for many young patients. The objective of present study was to compare the mean decrease in pain score following initial orthodontic arch wire placement, in flurbiprofen versus wafer groups. Present study was conducted at Orthodontic department of de'Montmorency dental college, Lahore, and at Orthodontic department of Dental Section-FMU/PMC, Faisalabad. Study involved 200 orthodontic patients that were placed randomly in to flurbiprofen and wafer groups (100 each group). Pain recording was done by patients using Visual Analog Scale (VAS) Questionnaire. Results showed that pain score differences were insignificant at different time intervals between the two groups. It was concluded that wafers are equally effective for initial pain control in orthodontic patients.

Key Words: *Wafers; Orthodontic Pain; Flurbiprofen.*

INTRODUCTION

Pain following initial orthodontic fixed appliance therapy is an issue of concern for many young patients.[1] There are many factors that can influence the pain phenomena following initial arch wire placement, it includes, age, gender, degree of crowding, orthodontic treatment planning, history of recent oral surgery, and other psychosocial factors.[2-5]

Pain following initiation archwire placement usually arises within few hours after placement of initial arch wires, reaches its maximum peak at 24 hours after placement of initial arch wires and declines to zero by 7th day after placement of initial arch wires.[6,7]

Pain following initiation archwire placement usually arises because of accumulation of ischemic, oedematous and inflammatory products in the compressed periodontal ligament.[8] These ischemic, oedematous and inflammatory products causes irritation of nerve endings present in the compressed periodontium thus results in pain.[9]

There are various methods to control pain following initiation of orthodontic treatment. The traditional and gold standard method of controlling pain following initiation of orthodontic treatment is use of Non steroidal anti-inflammatory drugs (NSAIDs).[10] Various non-pharmacological methods also exists to control pain following initiation of orthodontic treatment, these non-drug methods are: Lasers, Vibrations, Chewing gums, and Bite wafers.[11-14] The advantages of non-pharmacological methods are avoidance of systemic and local adverse effects associated with NSAIDs.

The objective of present study was to compare the effect of flurbiprofen and wafers on pain control after initial arch wire placement in terms of decrease in Visual Analogue Scale (VAS) score. Present study was conducted at Orthodontic department of de'Montmorency College of Dentistry and at Orthodontic department of Dental Section-FMU/PMC, Faisalabad.

METHODOLOGY

This prospective randomized clinical trial was conducted at Orthodontic department of de'Montmorency College of Dentistry and at Orthodontic department of Dental Section-FMU/PMC, Faisalabad. Duration of this study was from 2016 to 2018. Estimated Sample size was 200 patients using 95% confidence level, d= 0.5, 80 % power of test.[15]

Inclusion criteria were: 12 to 16 years of age, irrespective of Gender, and requiring four first premolar

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extractions for orthodontic reasons. Exclusion criteria were: Medically compromised patients, on any medications, contraindication to the use of flurbiprofen, and dental surgery in the previous four weeks.

Study involved 200 orthodontic patients that were placed randomly in to flurbiprofen and wafer groups (100 each group) using random number table. The third controlled group could have been included but one of the limitation of this study was that control group was not included.

Bonding was done and initial arch wires were placed. In the flurbiprofen group, the subjects were prescribed to take a 100-mg flurbiprofen tablet immediately after wire insertion and at 8-hour intervals for a week if pain persisted. In the wafer group, the patients were prescribed to bite on a wafer (horse-shoe shape, made of polyvinyl siloxane, with moderate toughness of 5 MPa) for five minutes at 8-hours interval for a week if a week if pain persisted. Pain recording was done by patients using Visual Analog Scale (VAS) at baseline, immediately after arch wire insertion, at 12th hour, at 24 hours, 2 days, 3 days and 7th day after arch wire insertion. The pain recording was done during 4 functions i.e. chewing, biting, fitting back teeth, and fitting front teeth. For fitting anterior and posterior teeth, the patients were asked to not eat anything and were asked to take lower teeth forward with upper teeth in edge to edge with light force and to fit the posteriors with light force, and then grade their pain on VAS. The orthodontists who did bonding were blind about the on-going study.

Age and VAS score was presented by mean ±SD while gender was presented by frequency and percentages. Independent sample t test was used for between the group analyses while ANOVA was applied to calculate within the group differences with P-value ≤ 0.05 as statistically significant. A workflow diagram adopted from CONSORT is also shown in Figure 1.

RESULTS

The response rate was 100%. The average age at enrolment for the subjects in FB group was not significantly different from WG group (FB, mean = 14.2; SD=2.0; WG, mean=14.4; SD=1.8) (Table 1). The percentages of girls in the 2 groups were also similar (FB, 49%; WG, 53%) (Table 2).

No significant differences in VAS pain score between the two groups at different time intervals for all the four functions (Table 3). The VAS pain score over time was statistically similar for the 2 groups (Table 3 & 4).

Results of stratification for pain score in both the groups with respect to age and gender groups for 4 functions showed insignificant differences. Results of stratification for pain score in both the groups with respect to age and gender groups for different time intervals showed insignificant differences.

DISCUSSION

There are various methods to control pain following initiation of orthodontic treatment.[10-14] The objective of present study was to compare the effect of flurbiprofen and wafers on pain control after initial arch wire placement in terms of decrease in VAS pain score. Present study was conducted on 200 subjects at Orthodontic department of de'Montmorency College of Dentistry and at Orthodontic department of Dental Section-FMU/ PMC, Faisalabad.

In the present study pain recording was done by patients using VAS pain scale at baseline, immediately

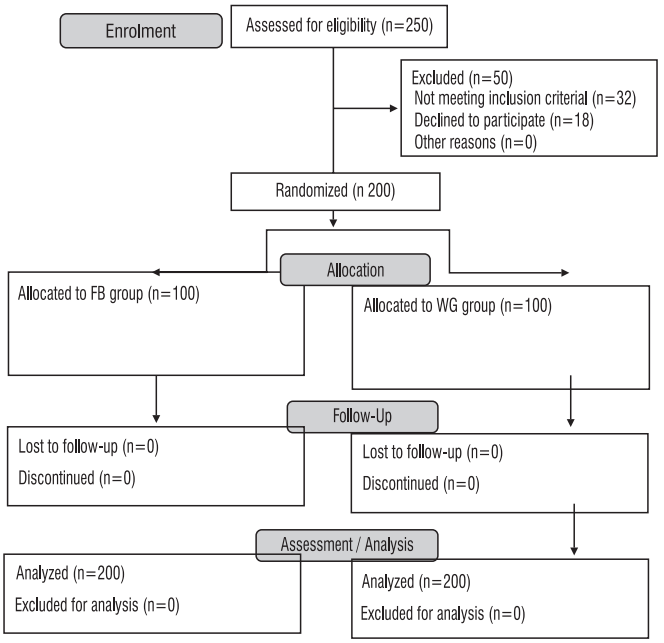

Fig 1: Workflow diagram adopted from CONSORT

TABLE 1: OVERALL AGE DISTRIBUTION (N=200)

Age(in years)	No. of patients	%
13-15	110	55
16-17	90	45
Total	200	100

Mean+SD: 14.55+1.88

TABLE 2: OVERALL GENDER DISTRIBUTION (N=200)

Gender	No. of patients	%
Male	98	49
Female	102	51
Total	200	100

TABLE 3: COMPARISION OF VAS PAIN SCORE BETWEEN FLURBIPROFEN (FB) AND WAFER (WG) GROUP

FUNCTION	GROUP	Immediate	12 hours	24 hours	2nd DAY	3rd DAY	7th DAY
CHEWING	FB GROUP	4.34 ± 0.12	4.67 ± 0.13	4.45 ± 0.13	4.13 ± 0.52	3.43 ± 0.98	1.89 ± 0.34
	WG GROUP	3.25 ± 1.67	4.72 ± 1.62	5.11 ± 1.44	5.24 ± 1.51	4.66 ± 1.65	1.56 ± 1.23
	P VALUE*	0.256	0.573	0.564	0.144	0.766	0.578
BITING	FB GROUP	5.65 ± 0.23	5.95 ± 0.82	6.76 ± 0.13	5.78 ± 0.99	3.44 ± 0.34	1.33 ± 0.12
	WG GROUP	5.78 ± 1.22	6.12 ± 1.35	6.78 ± 1.41	5.56 ± 0.90	4.13 ± 1.50	2.34 ± 0.76
	P VALUE*	0.765	0.529	0.899	0.143	0.674	0.652
FITING FRONT TEETH	FB GROUP	3.32 ± 1.33	3.76 ± 1.12	4.34 ± 1.77	2.88 ± 1.45	2.34 ± 1.63	1.44 ± 1.67
	WG GROUP	3.12 ± 0.56	4.66 ± 1.23	5.89 ± 1.23	3.78 ± 1.98	3.86 ± 1.31	1.87 ± 1.21
	P VALUE*	0.099	0.089	0.098	0.456	0.145	0.076
FITING BACK TEETH	FB GROUP	4.23 ± 0.54	3.21 ± 0.66	3.43 ± 0.55	2.55 ± 0.34	2.43 ± 0.76	1.12 ± 0.54
	WG GROUP	3.12 ± 1.56	2.22 ± 1.89	3.78 ± 1.87	2.03 ± 1.65	1.45 ± 1.78	1.67 ± 1.73
	P VALUE*	0.654	0.565	0.455	0.434	0.322	0.099

*t test results

TABLE 4: COMPARISON OF MEAN REDUCTION IN PAIN SCORES OVER THE TIME BETWEEN THE TWO GROUPS (N=200)

	Immediate	12 hours	24 hours	2nd day	3rd day	7th day
FB group	4.12± 1.22	4.32± 1.45	4.64± 1.10	3.94± 1.37	3.34± 1.76	1.67± 1.47
WG group	4.03± 1.16	4.27± 1.23	4.53± 1.91	3.35± 1.25	3.24± 1.20	1.57± 1.05
P value	0.645	0.744	0.873	0.567	0.456	0.655

after arch wire insertion, at 12th hour, at 24 hours, 2 days, 3 days and 7th day after arch wire insertion. The pain recording was done during 4 functions. This is similar to the methodology of previously conducted study, which compared the effect of ibuprofen and chewing gums on pain control after initial arch wire placement in terms of decrease in VAS pain score.[15]

Results of the present study showed that pain was at peak at 24 hours after placement of initial arch wires and declines to baseline levels by 7th day after placement of initial arch wires. This is in accordance with the results of previous studies that showed that pain following initiation of orthodontic treatment usually arises within few hours after placement of initial arch wires, reaches its maximum peak at 24 hours after placement of initial arch wires and declines to zero by 7th day after placement of initial arch wires.[13-16]

Results of stratification in the present study for pain score in both the groups with respect to age groups showed insignificant differences. This is in accordance with previously conducted studies,[13-16] but in contrast with the findings of other studies[17,18]. Results of stratification in the present study for pain score in both the groups with respect to gender groups showed insignificant differences. This is in accordance with previously conducted studies,[13-16] but in contrast with the findings of other studies[17,18].

Results of the present study showed no significant differences in VAS pain score between the two groups at different time intervals for all the four functions. Pain management for the FB group as indicated by mean decrease in VAS pain score was not inferior to that of the WG group. This is similar to the results of previously conducted local study which compared the effect of ibuprofen and chewing gums on pain control after initial arch wire placement in terms of decrease in VAS pain score.[16] Results are also in accordance with other international studies on chewing gums and wafers.[13-15,19,20]

Thus it was found that wafers are equally effective for initial pain control in orthodontic patients. The advantages of non-pharmacological methods like wafers are avoidance of systemic and local adverse effects associated with NSAIDs. Limitation of the present study is small sample size. Further large scale studies are suggested.

CONCLUSION

The wafers are equally effective for initial pain control in orthodontic patients.

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5 Munawar Manzoor Ali:	Critical Review of Manuscript.
6 Shabbir Hussain Shah:	Analysis of data, Manuscript writing.