

Movement Matters; How Physical Activity Impacts Endodontic Therapy

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ABSTRACT

Objective: To understand impact of physical activity on pain perception in patients presenting with acute pulpitis for endodontic therapy.

Study Design: It was quantitative correlational by design.

Place and duration of study: Department of Operative Dentistry, Dental Section, Islam Dental College, Sialkot.

Materials & Methods: 500 patients from the Dental Section of Islam Dental College Sialkot were included in this study. The correlation of movement/walk and pain during endodontic treatment was determined. Numeric pain scale was used to document pain. Activity was measured by the number of minutes of walk of the patient.

Results: There is a significant association between physical activity/exercise and pain. Statistical significance between pain and exercise was -0.158 .

Conclusion: Pre-operative assessment of physical activity may be a predictor of pain perceived by patients. Therefore, it is important to educate and consider patient's physical activity to manage pain during the dental treatment. Life style modification may seem insignificant but has proven positive impact in pain management.

Keywords: Exercise, local anaesthesia (LA), endodontic therapy, pain.

INTRODUCTION

Small things seem insignificant but our life style plays a significant role in modifying our body physiology and this directly and indirectly impacts our overall health. Physical activity like walk or running improves body metabolism and adaptation capacity. Pain perceived during endodontic therapy activates the body homeostatic system. Body's capability to adjust to such situations of pain and anxiety is multifactorial, amongst which walk and physical activity are important. Pain experienced during endodontic treatment is a situation where our body responds to such situations¹. An element of fear is associated with endodontic therapy has been reported as a reason for avoiding dental treatment². Multiple factors have been reported for these findings like, physiological, psychological and emotional factors^{1,3,4}. But role of activity and association with pain perception has not been thoroughly evaluated.

Physical factors like breathing, body hydration and movement influence the patient's perception during endodontic treatment, so the patient's level of physical activity, body response to sympathetic stimulation impacts pain control⁵. Anxiety of dental treatment puts the patient in state of apprehension⁶.

Anxiety and fear are common among dental patients. Most patients are apprehensive when present in a clinical setting⁶. Anxiety and stressful situation requires

effective sympathetic regulation by the body to overcome such situations⁷. Therefore the patient's physiological response to adjust to such anxious state depends upon how well accommodative is the patient's physical ability. Physical activity in the form of walk and exercise play significant role in controlling such situations⁸.

Exercise and pain has strong correlation proven by a number of studies¹⁷, which state that major generators of anxiety are anaesthetic injections and perception of pain related to dental procedures¹¹. Our aim was to estimate the efficacy of physical activity and its correlation with pain levels during endodontic therapy.

PATIENTS AND METHODS

Five hundred patients visiting Dental Section of Islam Dental College were included in the study. Study was quantitative correlational design in nature. After getting approval from the institutional ethical committee, the non-probability purposive sampling technique was used for data collection. Age range of the patients was between 10-70 years. Patients on anti-psychotic medication, sedative and hypnotics were excluded from the study.

Pain perception was documented using the numeric pain scale. No pain was recorded as 0 while severe pain was recorded as 10¹⁵. Mild pain was scaled from 1-3, moderate pain was scaled from 4-6 and severe pain was scaled from 7-10. Walk and physical activity was documented using the number of minutes of walk. No activity was scaled as 0, 10 minutes' walk was scaled as

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very light walk, 20 minutes' walk was scaled as light walk, 30 minutes' walk was scaled as moderate walk and 40 minutes' walk was scaled as heavy walk. Data analysis and correlation was determined using SPSS version 23.

RESULTS

Five hundred patients were enrolled in the study patient's age range was between 10-70 years. 294 patients were females while 206 patients were males. Mild pain was reported in 250 patients, 158 patients reported with moderate pain while 92 patients reported with severe pain. Only 1 patient with heavy walk reported with mild pain, out of 130 patients with moderate walk, 85 cases presented with mild pain, 33 cases reported with moderate pain and 12 cases reported with severe pain. Among the light walk group of 130 patients, 76 cases reported with mild pain, 60 cases with moderate pain and 37 cases with severe pain. In the very light walk group of 95 patients 47 cases presented with mild pain, 29 cases with moderate pain and 19 case with severe pain. Lastly in the no walk group of 101 patients, 41 cases presented with mild pain, 36 cases reported with moderate pain and 24 with severe pain.

Table 1: Gender Frequency

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
M		206	41.2	41.2	41.2
	F	294	58.8	58.8	
Total		500	100.0	100.0	100.0

Table 2: Walk

	Frequency	Percent	Valid Percent	Cumulative Percent
no walk (0 minutes)	101	20.2	20.2	20.2
very light walk (10 minutes)	95	19.0	19.0	39.2
light walk (20 minutes)	173	34.6	34.6	73.8
moderate walk (30 minutes)	130	26.0	26.0	99.8
heavy walk (40 minutes)	1	.2	.2	
Total	500	100.0	100.0	100.0

Table 3: Numeric pain Scale

Valid		Frequency	Percent	Valid Percent	Cumulative Percent
mild pain (1-3)		250	50.0	50.0	50.0
	moderate pain (4-6)	158	31.6	31.6	81.6
	severe pain (7-10)	92	18.4	18.4	
Total		500	100.0	100.0	100.0

Table 4: Walk and numeric pain scale cross tabulation

	Numeric Pain Scale			Total
	mild pain (1-3)	moderate pain (4-6)	severe pain (7-10)	
no walk (0 minutes)	41	36	24	101
very light walk (10 minutes)	47	29	19	95
light walk (20 minutes)	76	60	37	173
moderate walk (30 minutes)	85	33	12	130
heavy walk (40 minutes)	1	0	0	1
Total	250	158	92	500

There exist a statistical significance between walk and pain perception to $-.158$. Tables 1 represents the gender distribution, table 2 represents the number of minutes of walk, table 3 represents the perceived pain and table 4 represents the cross tabulation between walk and pain,

table 5 represents the correlation between walk and pain. Figure 1 gives frequency distribution of age. Walk and pain reported were of statistical significance in this study.

Table 5: Correlation

		Numeric Pain Scale	Walk
Numeric Pain Scale	Pearson Correlation	1	$-.158^{**}$
	Sig. (2-tailed)		.000
	N	500	500
Walk	Pearson Correlation	$-.158^{**}$	1
	Sig. (2-tailed)	.000	
	N	500	500

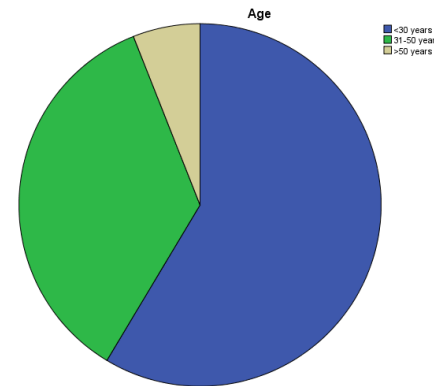


Fig 1: Frequency of Age

DISCUSSION

Life style has a strong influence on all spheres of life. Physical activity is one of the fundamental pillars for optimal health. Walk is one of the best forms of physical activity that improve metabolism and overall health. In an attempt to improve the quality of endodontic care clinician's should focus on life style modification along with advancement in endodontics¹⁸.

In our study, we investigated the impact of walk on patients who were undergoing endodontic treatment for irreversible pulpitis. We hypothesized that patients undergoing endodontic therapy will benefits from habit of physical exercise like walk. Although there is evidence that dental practices are effective at reducing dental pain using various pain management techniques like local anesthesia, oral sedation, inhalational sedation, pre-medication and other pain management techniques and equipment¹⁹⁻²⁰. Focusing on the patient's life style including, oral breathing, adequate body hydration, balanced diet intake, exercise and adequate sleep have been neglected. This study is aimed at identifying the correlation of physical activity and pain.

Statistical significance was found between walk and pain control in patients undergoing endodontic treatment. This strongly suggests that exercise¹⁷ helps in better pain control in patients undergoing painful procedure like endodontic therapy.

Physical activity¹⁷ and sleep hours have proven to be a major reason of pain experienced by patients. Therefore, assessing the effects of exercise and other life style modifications will not only help clinicians chose methods to reduce anxiety and pain in dental patients, but will also positively impact the pain management during endodontic therapy. In fact, regular exercise and sleep will improve the

chances of pain control with reduce anxiety. There exits is a significant association between physical activity/exercise and pain. Statistical significance between pain and exercise was -.158.

Exercise is a proven methodology of effective pain control^{13,21}. Increased levels of biological stress due to sedentary life style has been linked heightened pain perception, suggesting a significant relationship between the patient's biological stress, sleep deprivation and perception of pain intra-operatively¹⁴. Emotional well-being is strongly related with physical activity, while sedentary life style heightens anxiety thus increasing pain perception before and after endodontic therapy⁹⁻¹⁰. Research has proven the effectiveness of adequate physical activity and its impact on pain perception¹². While other studies have proven the role of exercise and physical activity in controlling pain^{15,16}.

To improve the quality of dental care clinicians must focus on life style modifications. Just educating the patients of regular walk or physical activity will have positive outcome on the patient's well-being and quality of dental care will improve subsequently.

CONCLUSION

Pre-operative stressors like dental anxiety, sleep deprivation and exercise are major predictors of pain when we visualize the broader picture. Simple acts of life style improvement like walk, exercise and sleep play an important role in improving endodontic treatment outcome. Professionals need to evaluate life style of their patients for optimal endodontic care. No doubt, advancement in sedation and pain management is outstanding, but with simple life style modifications a clinician can prevent his patients from the potential risks associated with sedation and anaesthesia.

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