ORIGINAL ARTICLE

Comparing the Diabetic Patients to Non-Diabetic in Terms of Flare-Up During Endodontic Treatment

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ABSTRACT

Objective: Comparing the diabetic patients to non-diabetic in terms of flare-up during endodontic treatment.

Material and Methods: This cross-sectional comparative study was conducted at department of Operative Dentistry, Liaquat University of Medical and Health Sciences Jamshoro/Hyderabad, from June 2015 to April 2016. The study included both the non-diabetic and diabetic individuals with periapical or pulpal pathosis who received orthodontic management on all teeth excluding the third molars, ranging in age from 15 to 75 years and of any gender. After the administration of local anaesthesia, a flexible dam was used. Access cavity was made using high speed handpiece containing diamond bur, which was disinfected using NaOCL 2.25%, Radiographic method was used to determine working length, coronal flaring was performed using G.G burs, K-files were used for apical preparation using step back method, canal was irrigated using NaOCL, temporization of tooth was done using intra-canal placement (CaOH) for 7 days, flare-up was observed for one week after RCT initiation. On next visit of patients intra-canal medications were removed by gentle filing and irrigation. X-rays were taken to assess whether intracanal medication has removed completely and then using paper points canal was dried, obturation was performed using guttapercha and (sealer) selapex via lateral condensation. Once again flare-up was observed for 1 week following obturation; patients were provided the proforma to daily mark pain level according VAS for up to 7 days.

Results: The study included overall 100 patients, equally divided into two groups i.e., diabetics and non-diabetics. The mean age of all study subjects was 35.37$\pm$3.12 years, with predominance of female gender (61%). Diabetic patients were found to have significantly more Flare up (day 1st to day-5th) than the non-didactic study subjects ($p<0.05$). Nearly all diabetic study subjects exhibited good response on day 5th and only 1 case was found to have Flare up with complain of severe pain. In both of the groups, flare up was reduced almost completely on day 6th and day 7th day. As per VAS, comparison of mean pain revealed rapid decline of pain in non-diabetic study subjects, showing significant variance from day 1 to day 5; P-value 0.001.

Conclusion: It was concluded that association of flare-up was statistically more significant with diabetics than the non-diabetics following endodontic treatment.

INTRODUCTION

Endodontic treatment commonly faces a complication termed as endodontic flare-up, which is an acute worsening of asymptomatic periapical or pulpal pathosis following instigation or continued root canal treatment (RCT).Flare up, during endodontic treatment, is an unfavorable event for both the operator and the patient leading to distress. Flare ups can develop due to different factors such as, microbes, treatment procedures, and host defense.[1] Diabetes mellitus (DM), as a systemic condition, has various major complications that affect both the life expectancy and standard of life[2] DM acts as a strong modulating factor in endodontic pathosis. DM patients presenting for endodontic therapy predominantly per radicular pathosis DM patients can possibly have raised perioperative complications.[3] Over the last three decades DM has been accepted as a key disease linked with elevated mortality and morbidity.[4] Globally, Pakistan stands on 6th position, representing 1000000 DM patients of age range 20-79 years.[5] DM has been hypothesized to result in oral infections, which increases the RCT failure rates. Insulin receiving diabetic patients who are diagnosed to have per radicular lesions are inclined to suffer more frequently from per radicular pain in comparison to non-diabetics. DM patients are also at the two-fold risk flare ups rates along with much lesser frequency of achieving successful intervention in comparison to non- diabetics. [4,6] DM patients frequently have raised levels of serum LDL, triglycerides, and cholesterol, even with adequately controlled levels of blood glucose. This situation can alter the activities of immune cells, leading to raised release of pro-inflammatory cytokines as well as reduced release of growth factors that are necessary for the homeostasis of normal tissue and healing process. These mechanisms can lead to inflammation of oral tissues, however inflammation regulation is significantly vital for oral care administration in long- term.[7] Globally, 240,000,000 individuals are struggling with DM, Prevalence of DM is much higher in Pakistan (12.8%) representing 6.9 million individuals.[8,9] There is a tendency toward more symptomatic periradicular disorder and flare-ups, and a history of DM is linked to a lower chance of success.[10] Furthermore, studies were conducted in other populations around the world, however no such research has been reported in our indigenous population,

because of the continuously high prevalence of DM in Pakistan and a higher risk of serious endodontic infectious diseases, It also highlighted the necessity for consideration by evaluating the rate of endodontic flare-up in our local population suffering from diabetes, which clarified the importance for careful assessment to eliminate the failure of root canal treatment .

MATERIAL AND METHODS

This cross sectional Comparative study was conducted at department of Operative Dentistry, Liaquat University of Medical and Health Sciences, Jamshoro/Hyderabad. From June 2015 to April 2016

Inclusion Criteria

- All teeth excluding 3rd molars.
- Diabetic or non-diabetic patients
- Patients of age group 15 to 75 years.
- Patients with periapical or pulpal pathosis.
- Patients of both genders.

Exclusion Criteria

- Children.
- Pregnant and lactating mothers.
- Smoker.
- Patients with poor oral hygiene.
- Medically compromised patients.
- Patients receiving antibiotic prophylaxis.
- Patients with acute symptoms of pain or swelling.

Data Collection Procedure: Patients were diagnosed based on their medical records, radiographic examination, and clinical examination. Before beginning the procedure, each patient was given informed consent and their blood sugar levels were checked using a glucometer. After the administration of local anaesthesia (epinephrine 1:100000) and xylocaine 2%), a flexible dam was used. Access cavity was made using high speed handpiece containing diamond bur, which was disinfected using NaOCL 2.25%, Radiographic method was used to determine working length, coronal flaring was performed using G.G burs, K-files were used for apical preparation using step back method, canal was irrigated using NaOCL, temporization of tooth was done using intra-canal placement (CaOH) for 7 days, flare-up was observed for one week after RCT initiation. On next visit of patients intra-canal medications were removed by gentle filing and irrigation. X-rays were taken to assess whether intracanal medication has removed completely and then using paper points canal was dried, obturation was performed using guttapercha and (sealer) selapex via lateral condensation. Once again flare-up was observed for 1 week following obturation; patients were provided the proforma to daily mark pain level according VAS for up to 7 days. Data analysis was made using SPSS 20.

RESULTS

The study included overall 100 patients, equally divided into two groups i.e., diabetic (n=50) and non-diabetic (n=50), mean age of all study subjects was 35.37±3.12 years. Females were found in majority as 61% and males were (39%). The age of study subjects ranged from 15 to 61 years. Table:1.

Diabetic patients were found to have significantly more Flare up (day-1st to day-5th) than the non-didactic study subjects (p-<0.05). Nearly all diabetic study subjects exhibited good response on day 5th and only 1 case was found to have Flare up with complain of severe pain. In both of the groups, flare up was reduced almost completely on day 6th and day 7th day. As per VAS, comparison of mean pain revealed rapid decline of pain in non-diabetic study subjects, showing significant variance from day 1 to day 5; P-value 0.001. Table 2

Table 1: Patients distribution according to age n=100

		Age
Mean		35.37 years
Standard deviation		03.12 years
Minimum		15 years
Maximum		61 years

Table 2: Mean comparison of pain (VAS) according to VAS in both diabetic and non-diabetic patients n=100

	Groups	Mean±SD	T-value	P-value
Day 1	Diabetic	36.50± 24.85	3.98	0.001
	Non-diabetic	18.50± 20.80		
Day 2	Diabetic	34.0± 23.01	6.58	0.001
	non-diabetic	8.50± 14.82		
Day 3	Diabetic	27.50± 20.97	7.69	0.001
	non-diabetic	3.0± 8.20		
Day 4	Diabetic	20.40± 16.11	4.59	0.001
	non-diabetic	7.50± 11.57		
Day 5	Diabetic	8.50± 11.96	3.33	0.001
	non-diabetic	2.0± 6.85		
Day 6	Diabetic	2.50± 7.57	-0.288	0.77
	non-diabetic	3.0± 9.63		
Day 7	Diabetic	1.0± 4.94	-0.00	1.00
	non-diabetic	1.0± 4.94		

DISCUSSION

Flare-up is a complication encountered during endodontic therapy, which is described as an acute worsening of asymptomatic pulp or periradicular pathosis as a result of continuing or initiating RCT.[11] Other characteristics include the occurrence of pain and/or swelling during endodontic therapy, as well as pain and/or swelling that requires unintentional therapy, which requires direct dentist involvement.[12] Pain perception is a highly subjective and variable phenomenon influenced by a variety of physically and psychologically causes, and perceived pain is influenced by factors other than the experimental procedures.[13]

In present study among diabetic patients flare up (average VAS) was seen significantly higher among diabetics than non-diabetics during day 1st to day-5th (P-<0.05). In support of our findings, Fouad AF et al[10] examined a number of cases of flare-ups seen during therapy, regardless of the pain severity or the number of flare-ups in each study subject prior to surgery, and found

that diabetics had flare-ups almost twice as compared to non-diabetics; again, this difference was statistically insignificant. There have been no other findings in the literature comparing Flare up between non-diabetics and diabetics in the course of endodontic therapy. However after endodontic treatment, the difference in incidence flare-ups between endodontic treatments with frequent and single-appointment was recently evaluated in a systematic study, although this review did not include diabetics and non-diabetics.[14]

In this study, females comprised 61% of the population, while males were 39%. However Onay EO et al[15] also found females in majority. On other hand Nair M et al[16] also found similar findings regarding gender.

In this study on day 1, diabetics had significantly higher rate of flare-ups than non-diabetics (p-0.001). On day 2, flare-ups increased in diabetics because in 21 cases reported severe pain and 4 study subjects reported extreme pain, however in non-diabetics, only 3 cases were found to have severe pain and extreme pain was not reported by any of the study subjects. Despite the similarities in flare-up descriptions, the incidence in this research was almost 5-fold higher than in previous research.[17] In an earlier study, the pain intensity at the time of evaluation was not specified. It implies that if the pain levels were measured for more than 48 hours, some patients could not be enrolled into study. Moreover, Tsesis Iet al[18] stated that POP was documented within 48 hours of procedure. The identification of apical pain and tenderness in controls (Group-1) took one month, while the identification of clinical symptoms in diabetics (Group-2) took two months.[19] Quadir F et al[20] stated that in both groups A and B, a steady decline occurred in pain following 24 hours and severe pain diminished following 72 hours, whereas group-C patients revealed pain of some intensity yet following 72 hours. Most researches that looked at a vast number of cases showed that women had more POP and flare-ups. DM can influence the extent and progression of periradicular infections. Even with appropriate endodontic treatment, in diabetic patients the first periradicular lesions can grow in size.[21] As compared to non-diabetics, diabetics had about double the incidence of flare-ups.[4,22] Pain plays a vital role in dentistry because fear of pain is a key contributor to dental anxiety. Even where enough anaesthesia is administered, POP is a major obstacle in orthodontic treatment. According to some research, the effectiveness of endodontic treatment is strongly linked to the decline or removal of post-endodontic pain in the range of 25- 40%.[23,24]

CONCLUSION

According to our findings, during orthodontic treatment, diabetics had significantly more flare-ups than non-diabetics. To avoid flareups, glycemic status must be controlled during endodontic treatment. This was a small sample size and single center study. However more large sample size studies are recommended.

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