

Prevalence Of Middle Mesial And Middle Distal Canals In Mandibular Molars Among Patients Visiting Dental College And Its Influence On Gender

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Abstract : ***Aim :** The aim of this study was to investigate the incidence of Middle mesial canal and Middle distal canal in mandibular molars and its influence on gender. **Materials and Methods :** This retrospective study was carried out at the department of Conservative Dentistry and Endodontics, Saveetha Dental College and hospitals, Chennai. Case records of 86,000 patients who had visited for dental treatment between 01-Jul-2019 and 31-March-2020 were assessed by SDC/SIHEC/2020/DIASDATA/0619-0320. Inclusion criteria for the study were presence of Middle Mesial Canal and Middle Distal Canal in mandibular molars. Records for each case were tabulated and after applying the inclusion criteria 25 case records were included in the study. This data was tabulated and analysed in SPSS and descriptive statistics was performed. **Results :** The results obtained were put into graphs and charts from the data which was exported to SPSS. After reviewing 8799 case records, data of 25 patients with Middle mesial canal and Middle distal canal were collected which showed that 14 patients were prevalent with Middle distal canal which was higher (56%) compared to Middle mesial canal (44%) in which 15 patients with MM & MD canal (60%) were seen in 36 which had higher prevalence with a higher male predilection (72%). There was no association found between teeth number and MM & MD canal. (Chi-square value - 4.051^a; p-value = 0.256) (p>0.05) and gender with MM & MD canal. (Chi-square value - 0.005^a; p-value = 0.943) (p>0.05) **Conclusion :** The result of the study showed that out 44% of the patients had prevalence to Middle mesial canal and 69% with Middle distal canal with a higher incidence in 36 with a higher male predilection and no significant association was found for teeth number and gender with MM & MD canal. Hence, identification of the extra canals and their instrumentation is important in the prevention of unsuccessful treatment outcomes.*

Keywords : Middle mesial canal, Middle distal canal, Molars, Variation

1. INTRODUCTION

Knowledge on both normal and abnormal anatomy of the root canal system states the parameters for execution of root canal therapy and it directly affects the results of endodontic therapy. Missed canals and accessory/lateral canals are a major reason for failure of root

canal treatment[1]. All the teeth may have accessory root canals, with an increased occurrence of canal variation in permanent molars and premolars.[2] Prior knowledge of root canal anatomy is essential for the success of endodontic therapy [3] to remove bacteria from the root canal system and prevent reinfection and it is important to access all the canals in the tooth during the root canal treatment[4][5].

The aim of the root canal therapy is to eliminate[6] all the irritants from necrotic pulp tissue like microorganisms and their byproducts. The mechanism of Root Canal Treatment includes proper cleaning , shaping using proper instrumentation. The reported prevalence of MM and MD canals differs among various studies. Methods of detection which were used in other studies included plastic NaOCl[7], apex locators[8], dental microscopes[9], CBCT [10], and use of Dental loupes[11]]. Based on the method used, MM canal prevalence ranged from 0%[7] to 36%[10]. Clinical studies on variation in MM canal shows results that differ from other studies involving extracted teeth. Two other older clinical studies reported an incidence of 2.6% [12] and 12% for negotiable MM canal.[13].

Pomeranz et al[14] described the MM canals as: fin which states that the file passes freely between the ML / MD canal and the MM canal , confluent where, the MM canal merges with the main mesial canal in the apical third and independent where MM canal originates as separate orifice and ends with a separate apical foramen. J.Kottorr et al.,[15] described in his study about his successful non surgical management of two-rooted right permanent mandibular first molar which had five root canal in the distal root. This present study was carried out to determine the incidence of MM and MD canals and its influence on gender visiting a dental college.

2. MATERIALS AND METHODS :

A descriptive cross-sectional study was carried out at a University Hospital setup in South India. Patients reported were of similar ethnicity within the particular geographic location so the trends in the other locations were not assessed in this study. Ethical approval was obtained from the University ethical committee and a total of three reviewers were involved in the study.

This retrospective cross-sectional study was carried at the department of Conservative Dentistry and Endodontics, in a Dental College. Case records of 86,000 patients who had visited for dental treatment from July 2019 to March 2020 were assessed by SDC/SIHEC/2020/DIASDATA/0619-0320 and the inclusion criteria for selecting the records for the study was the presence of Canal variation like Middle Mesial and Middle Distal Canal and teeth number. After applying the inclusion criteria 25 case records were included in the study which was reviewed by the examiner followed by cross verification. Patients with MB2 canals were considered as variables which were managed by importing to SPSS. This data was tabulated and analysed where the type of analysis used was Correlation and association , a descriptive type of data analysis.

3. RESULTS :

After analysing 8799 case records, a total of 25 subjects with Middle mesial canal and Middle distal canal were collected. From the analysis, it showed that out of 25 patients, 14 patients were prevalent with Middle distal canal which was higher(56%) compared to Middle mesial canal(44%)(Figure-1). The distribution of teeth number with MM & MD canal showed that out of 25 patients 15 patients with MM & MD canal (60%) were seen in 36

which was more prevalent. 7 patients in 46, 2 patients in 47 and 1 patient in 37 had MM & MD canal which was comparatively lesser(Figure-2). The distribution of gender with MM and MD canal showed that out of 25 patients 18 were males (72%) and remaining 7 were females (28%)(Figure-3). The association of teeth number with MM & MD canal showed that 32% of the MD canal and 28% of MM canal was seen in 36, 4% of MD canal in 37, 20% of MD canal and 8% of MM canal was seen in 46 and 8% of MD canal was seen in 47. There was no association of teeth number with MM & MD canal.(Chi-square value - 4.051^a ; p -value = 0.256) ($p > 0.05$)(Figure-4). The association of teeth number with MM & MD canal showed that 40% of the males were prevalent with MD canal and 32% to MM canal. 16% of females were prevalent with MD canal and 12% with MM canal. There was no association of gender with MM & MD canal.(Chi-square value - 0.005^a ; p -value = 0.943) ($p > 0.05$)(Figure-5).

4. DISCUSSION :

From the analysis, it showed 56% were prevalent with Middle distal canal which was higher compared to Middle mesial canal(44%) and was seen commonly in 36(60%). Adham A et al.,[16] supported stating that MM canal was seen in mandibular molars(46.2%). Mehranz et al.,[17] also supported stating MM canal was seen in mandibular molars (16.4%). Ali Nosrat et al.,[18] also supported stating prevalence of MM canals in mandibular molars(20%). Bansal R et al.,[19] also supported stating incidence of MD canals in mandibular molars(0.26% - 53.8%). No opposing studies were found. Hence overall consensus agreed with the study.

Previously our team had conducted numerous trials on postoperative pain after using endodontic needle and endoactivator during root canal irrigation [20], studies like CBCT evaluation of root canal preparation using rotary instruments [21], comparative evaluation of bioactive glass and topical cream [22], analysis of precipitation with formation of chlorhexidine interaction with NaHCl, neem and tulsi[23], reviews on natural product as the storage medium for avulsed tooth[24,25], calcified canal negotiation [26], studies like follow up of clinical performance of resin-modified glass ionomer cement, flowable composite, and polyacid-modified resin composite in noncarious cervical lesions [27], recent advancements in laminates and veneers in dentistry [28], chlorhexidine its properties and effects [29], regulation of matrix metalloproteinase-3 gene expression in inflammation, Diagnostic accuracy of dental pulse oximeter with customized sensor holder, thermal test and electric pulp test for the evaluation of pulp vitality, [30], shape optimal and clean more [31], comparative evaluation of grape seed and cranberry extracts in preventing enamel erosion [32], surveys like treatment modalities followed by dental practitioners for ellis class 2 fracture [33], awareness about the principal choice of intracanal medicaments among the general dental practitioners and non endodontic specialists [34]. Now we are focussing on epidemiological surveys, the idea for this study stemmed from the current interest in our own community.

There was a higher male predilection (72%) than females (28%). Maryam Kazemipoor et al.,[35] supported the stating higher male predilection (79.6%). No opposing studies were found then. The association of teeth number with MM & MD canal showed that 32% of the MD canal and 28% of MM canal was seen in 36, 4% of MD canal in 37, 20% of MD canal and 8% of MM canal was seen in 46 and 8% of MD canal was seen in 47. There was no association of teeth number with MM & MD canal.(Chi-square value - 4.051^a ; p -value = 0.256) ($p > 0.05$). The association of teeth number with MM & MD canal showed that 40% of the males were prevalent with MD canal and 32% to MM canal. 16% of females were prevalent with MD canal and 12% with MM canal. There was no association of gender with MM & MD canal.(Chi-square value - 0.005^a ; p -value = 0.943) ($p > 0.05$).

Limitations of the study was the Geographic location of the study population. In the future, a multicentric study with a larger sample size should be conducted to give a better estimation of incidence of variation in the canal among the entire population.

5. CONCLUSION:

The result of the study showed that 44% of the total population had prevalence to Middle mesial canal and 69% to Middle distal canal with higher incidence in 36 with a higher male predilection and there was no significant association for teeth number and gender with MM & MD canal. Further studies can be done analysing the risk of canal variation since it can provide a better knowledge in performing root canal treatment with a higher success rate.

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AUTHORS CONTRIBUTION :

All authors equally contributed to the study.

CONFLICT OF INTEREST:

Nil

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- Figure - 5** : Association of gender with MM and MD canal.

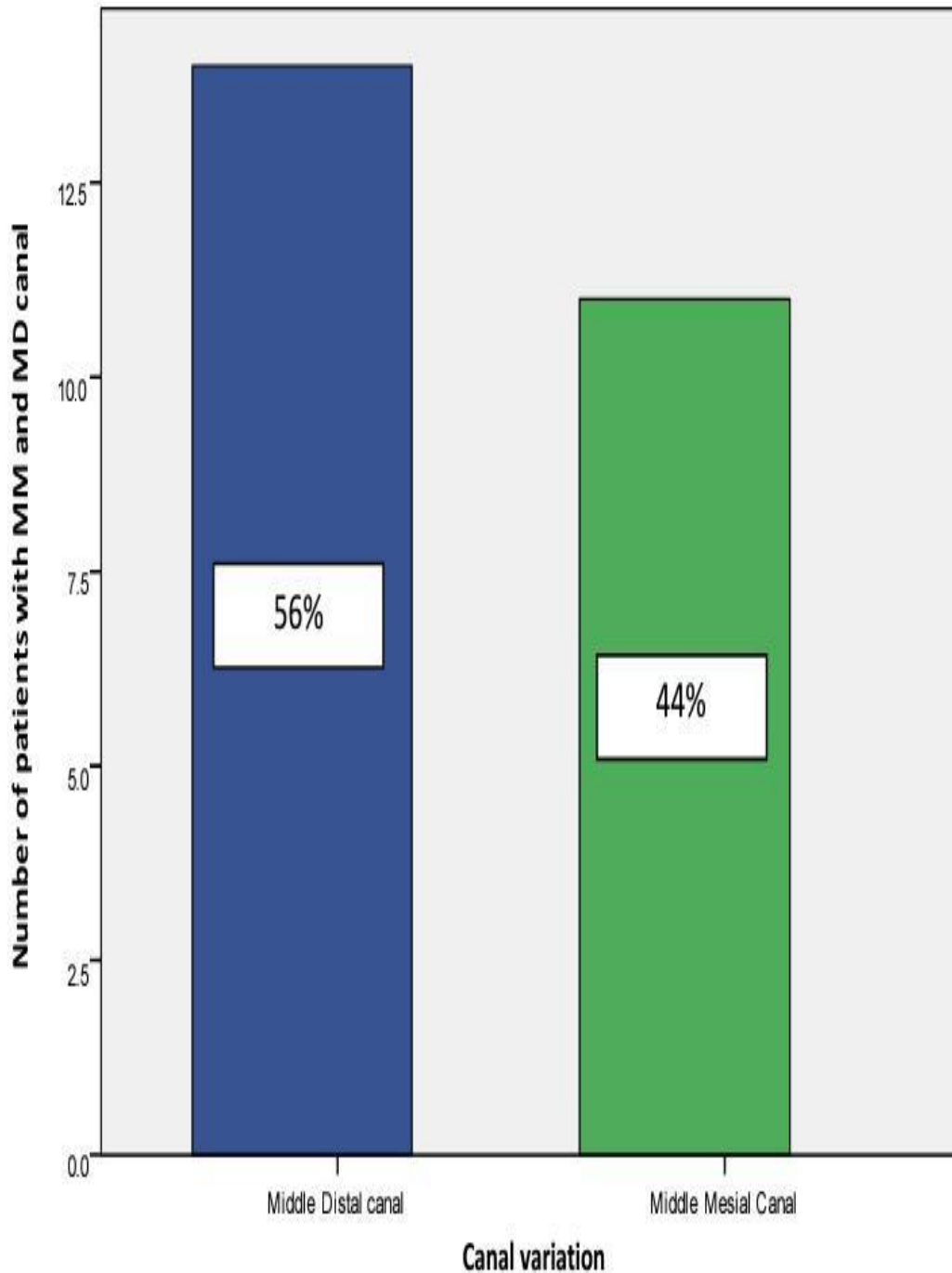


Figure - 1 shows the bar graph representing the distribution of Middle mesial and Middle distal canals among the patients. X-axis showed the Middle distal canal(blue) & Middle mesial canal(green) and Y-axis shows the number of patients with MM & MD canal. It shows that out of 25 patients, 14 patients were prevalent with Middle distal canals which was higher(56%) compared to Middle mesial canals(44%).

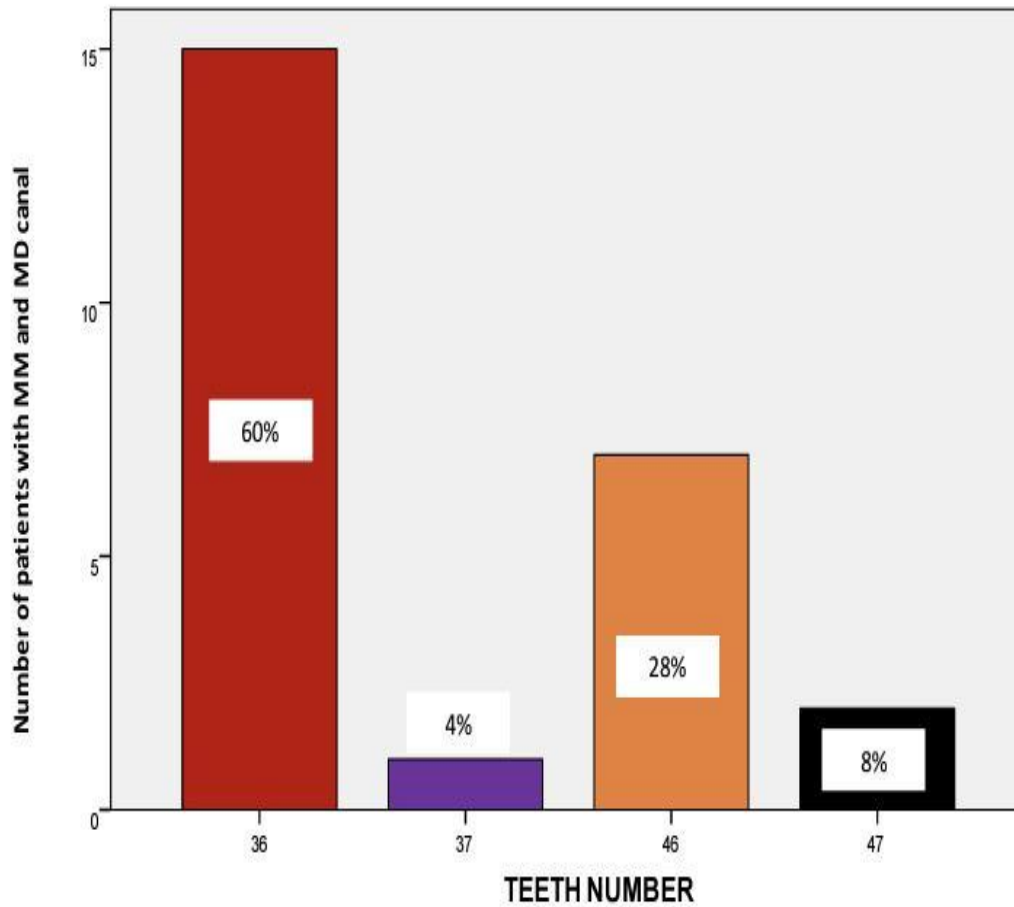


Figure - 2 shows the bar graph representing the distribution of teeth number with MM & MD canal. X-axis represents the teeth number as 36 (red), 46 (orange), 47 (black), 37 (violet) and Y-axis represents the number of patients with MM & MD canal. It shows that prevalence of MM & MD canals was more prevalent in 36 (60%) when compared to others.

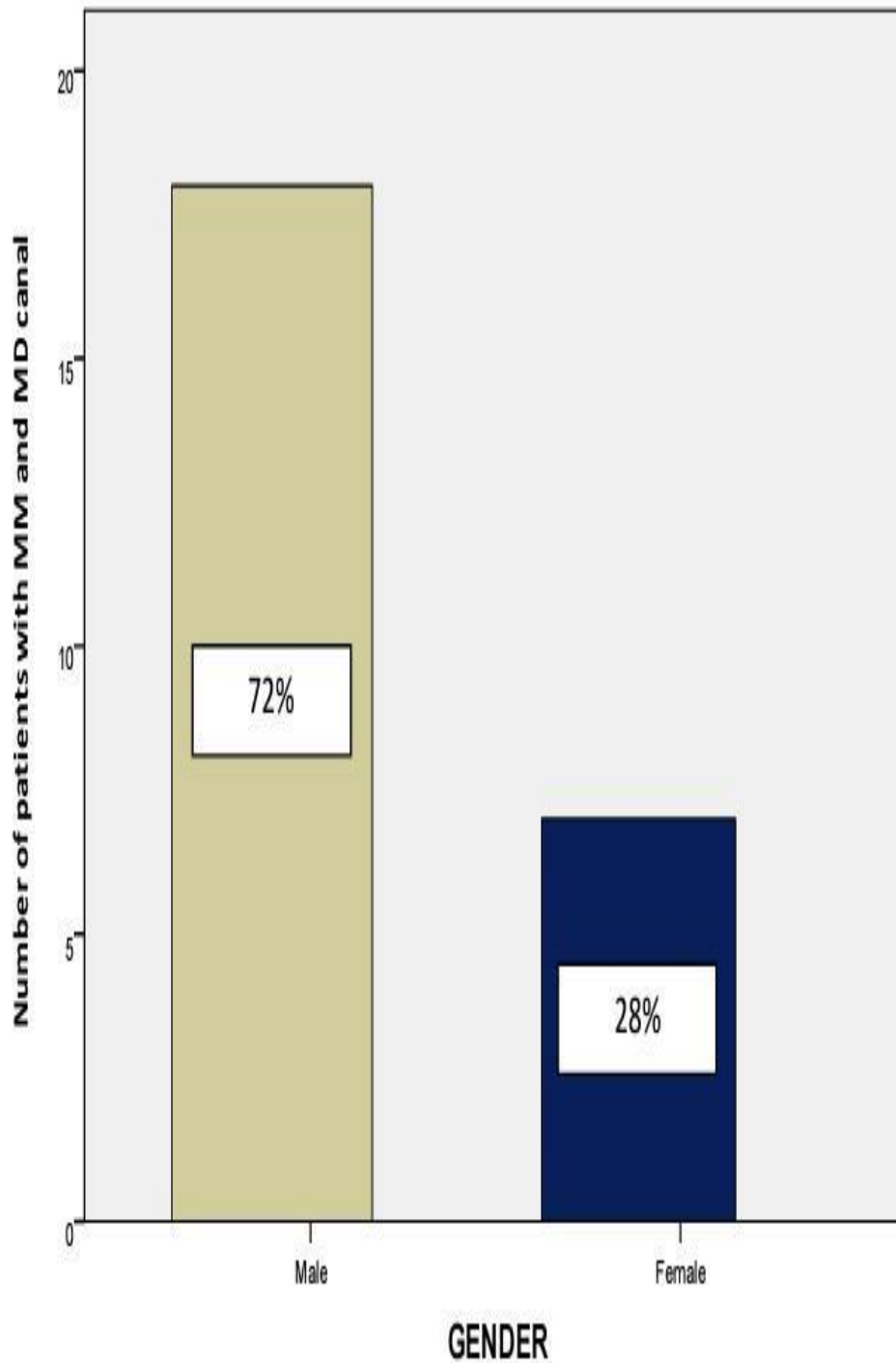


Figure - 3 shows the bar graph representing the distribution of Gender with MM & MD canal. X-axis represents the type of Gender [males(yellow) and females(indigo)] and Y-axis represents the number of patients with MM & MD canal. This shows the prevalence of MM & MD canals was higher in males (72%) when compared to females (28%).

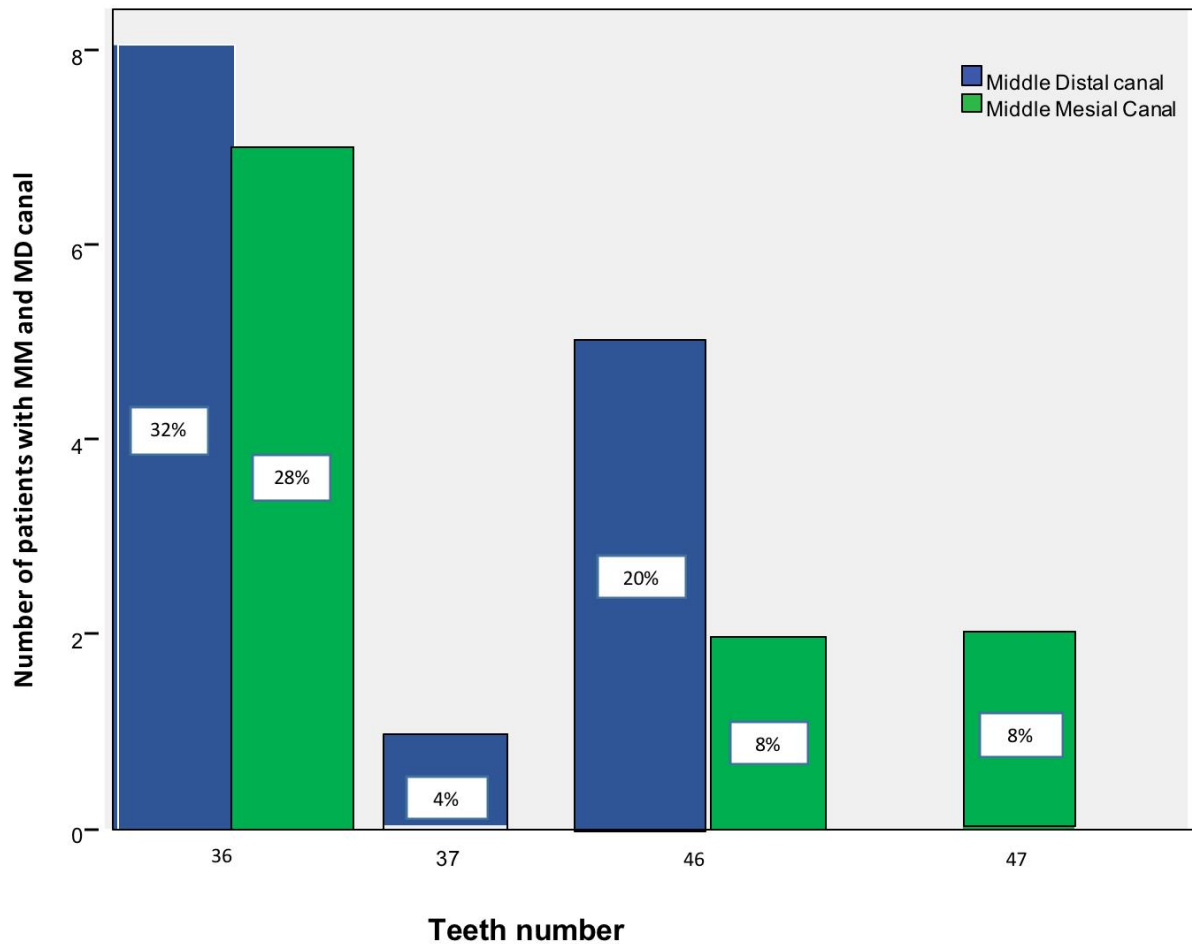


Figure - 4 shows the bar graph representing the association of teeth number with MM and MD canal. X-axis represents the teeth number and Y-axis represents the number of patients with Middle distal canal(blue) and Middle mesial canal (green). Chi-square test was done and association was found to be statistically not significant. Chi-square value - 4.051^a; p -value = 0.256 ($p > 0.05$) $df = 3$. It shows 36 with higher prevalence of MM & MD canals when compared to others.

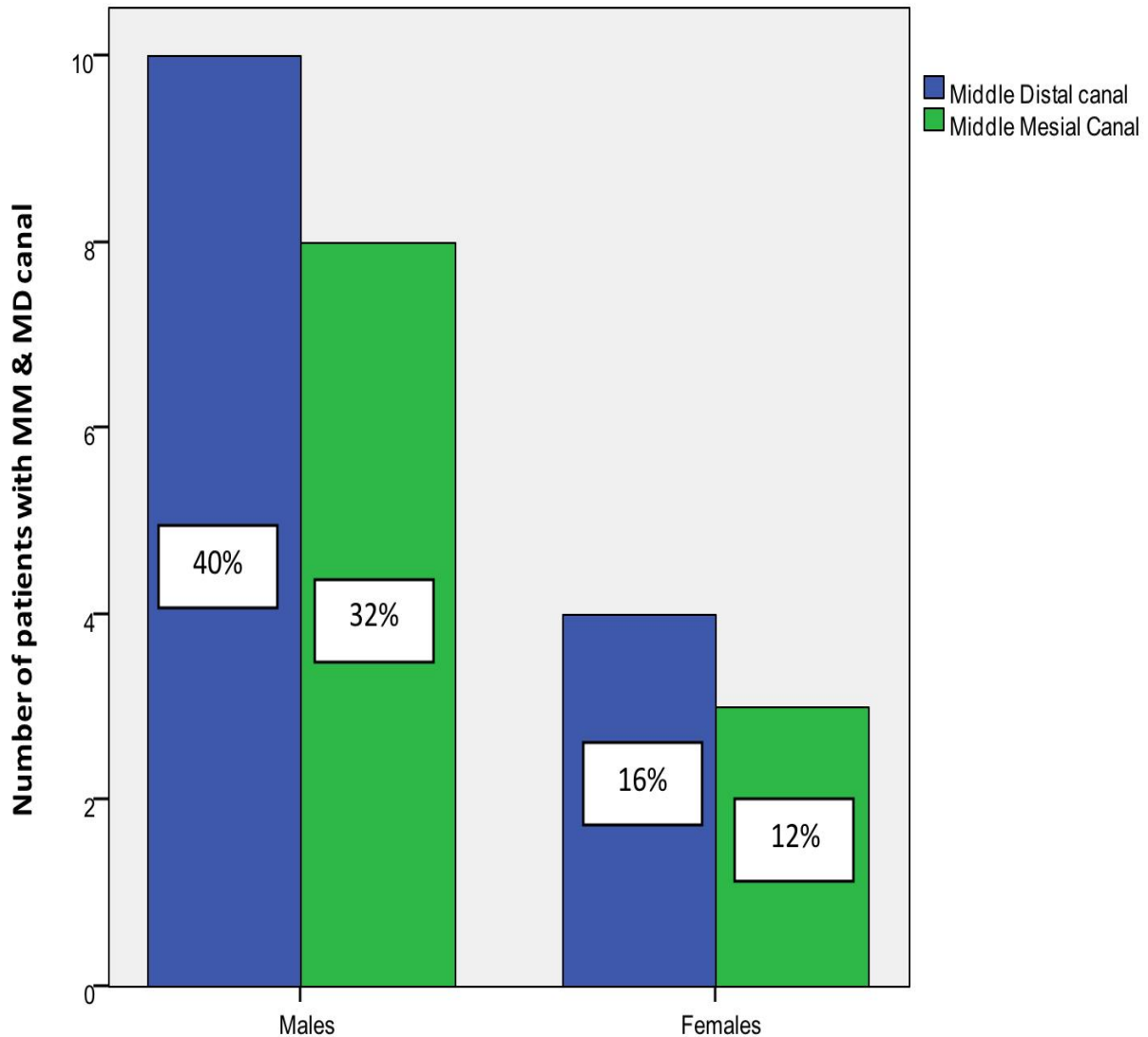


Figure - 5 shows the bar graph representing the association of gender with MM and MD canal. X-axis represents the type of Gender with Middle distal canal(blue) and Middle mesial canal (green) and Y-axis represents the number of patients. Chi-square test was done and association was found to be statistically not significant. Chi-square value - 0.005^a; p -value = 0.943 ($p > 0.05$), $df = 1$. It shows that males have higher prevalence of MM and MD canals compared to females.