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Prevalence And Distribution of Dental Anomalies Among Adult Population at Al-Kharj, Saudi Arabia

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Abstract

Background: Disturbance in the embryological stage during development of teeth can lead to dental anomalies. Dental anomalies are not an unusual and usually identified during routine dental examination. Dental anomalies can cause esthetic, functional and social problems. Aim: The aim of this study was to assess the prevalence of dental anomalies among adult population in Saudi Arabia. Methodology: This cross sectional study was conducted among subjects attending oral medicine department of college of dentistry, Prince Sattam bin Abdulaziz University at Al-Kharj. Orthopantomography taken among subjects during September 2015 to September 2017 were considered. Both the genders were included between the age group of 18 to 35 years. The panoramic images were examined in a standardized manner under good standardized screen brightness by two examiners. Results: the prevalence of Developmental Dental Anomalies in the present study was 10.26%. The various developmental dental anomalies observed were canine impaction 2.5%, supernumerary tooth was 0.83%, Dilacerations 2.80%, Prevalence of Impaction other than canines 1.26%, Prevalence of Fusions 0.31%, congenitally missing teeth. 1.53% and 0.84% of subjects had other developmental anomalies such as Pegs, odontomas supplementary teeth dens invaginatus etc. Conclusions: The prevalence of Developmental Dental Anomalies among adult population in Al – Kharj, Saudi Arabia is found to be 10.26% in present study and further prospective studies need to be conducted with use of wide array of modalities to establish possible etiological factor of developmental anomalies so that preventive strategies can be applied.

Keywords: *Dental Anomalies, impacted teeth, Dilacerations, supernumerary tooth, supplemental tooth.*

Introduction

Developmental dental anomalies (DDA) are one of the morphological and structural dental conditions. The etiology of these types of anomalies can be genetic, epigenetic or environmental reasons. These etiological events that occur during the development period before and after birth can be contributed to such anomalies, even though the genetic defect is the most influential factor (Kotsomitis N et al 1996).

Disturbance in the embryological stage during development of teeth can lead to anomalies in tooth shape (dens invaginatus, talon cusp, dens evaginatus, gemination, fusion, root dilacerations, taurodontism and concrescence), size (microdontia and macrodontia), number (hyperdontia, hypodontia and oligodontia) and structure (amelogenesis imperfecta, dentinogenesis imperfecta and dentin dysplasia). Disturbances in the eruption pattern causes positional anomalies such as rotation and ectopic eruption

(Neville DW et al 2005). It is important for the phylogenetic and genetic studies to have valuable information in the knowledge of the prevalence and the degree of expression of people with dental anomalies. And also to understand the differences among the various population groups (Yaacob H et al 1996).

While many epidemiological studies on developmental dental anomalies (DDA) that have been conducted among different parts of the world show that there are geographic and ethnic variations in their prevalence (Tsai SJ et al 1998; Kositbowornchai S et al 2010).

A few studies conducted in Saudi Arabia show that the variation of sampling and diagnostic materials is the reason for the differences in the prevalence of these anomalies (Osuji OO et al 2002; Afify AR et al 2012).

This study is planned to define the prevalence of developmental dental anomalies (DDA) among the population of al-Kharj, Saudi Arabia. Understanding their etiology is expected to be increased by the given information, to facilitate their diagnosis and effective solution.

Materials and Methods:

This is a retrospective cross sectional study based on the evaluation of DDA developmental dental anomalies on Orthopantomography (OPG) of outpatients attending the oral medicine and diagnosis department of college of dentistry, Prince Sattam bin Abdulaziz University in Al-Kharj city. OPG of Subjects attended between September 2015 to September 2017 was considered for the study.

Digital panoramic radiographs of both the gender living in Al-Kharj with an age range of 18 to 35 years were considered.

The exclusion criteria of the subjects were the presence of cleft lip and palate, patients with syndromes that could cause DDA such as Down's syndrome cleidocranial dysostosis, improper quality of radiographs, having orthodontic brackets and dental fracture that influence the diagnosis of the dental anomalies and third molars were also excluded as they commonly exhibit variation in their morphology and position.

All the x-rays were taken by qualified technician with the same device and the same standard method. The radiographs were taken by Carestream CS 8000 C machine and the images were processed with Henry Schien Exact software.

The panoramic images were examined in a standardized manner under good standardized screen brightness and resolution by two independent examiners. The kappa for inter-examiner reliability among examiners was found to be 0.92.

The selected radiographs were reviewed for the following DDA: Anomalies in tooth shape (dens invaginatus, talon cusp, dens evaginatus, gemination, fusion, root dilacerations, taurodontism and concrescence), size (microdontia and macrodontia), number (hyperdontia, hypodontia and oligodontia) and structure (amelogenesis imperfecta, dentinogenesis imperfecta and dentin dysplasia).

Statistical analysis: Descriptive statistics was computed. Results were expressed in number and percentages. Chi square test was used to check the statistical significant difference for various demographic factors. All data were analyzed by using SPSS Version 23. 95% confidence interval was considered and a p value less than 0.5 considered as statistically significant difference.

Results: Among the 3749 panoramic radiographs 63 radiographs has been excluded due to improper image quality and 373 radiograph has been excluded due to lack of patients date. So the total numbers of radiograph in present study was 3313. Males 2257 (68.1%) and females 1056 (31.8%) (table1). A total of 340 (10.26%) had DDA.

Results:

Among the 3749 panoramic radiographs 63 radiographs has been excluded due to improper image quality and 373 radiograph has been excluded due to lack of patients date. So the total numbers of radiograph in present study was 3313. Males 2257 (68.1%) and females 1056 (31.8%). The overall prevalence of Developmental Dental Anomalies was 10.26% that is 340 subjects out of 3313 had had DDA of one other the other kind. .

Table 2 and graph 2 shows prevalence of canine impactions. 2.5% of the subjects had canine impaction. Females had slightly more prevalence (3.03%) than compared to males (2.56%). There was no gender difference observed in the prevalence of canine impaction ($p>0.05$).

Table 3 and graph 3 shows prevalence of supernumerary teeth. The prevalence of supernumerary tooth was 0.83% majority was Distodens (48.27%). Males had 1.15% and females had 0.28%. The difference was statistically significant P (<0.05).

Table 4 and graph 4 shows prevalence of dilacerations. Male had more dilacerated tooth (3.45%) than compared to females (1.42%) overall prevalence was 2.80% according to gender the prevalence of dilacerations was statistically non significant ($p>0.05$).

Table 5 and graph 5 Shows Prevalence of Impaction other than canines. The overall prevalence was 1.26% and there was no gender difference statistically ($p>0.05$).

Table 6 and Graph 6 shows Prevalence of Fusions, fusions was observed among males only (0.31%) and difference was not significant statistically ($p>0.05$)

Table 7 and Graph 7 shows prevalence of congenitally missing teeth. 1.53% of subjects had congenitally missing tooth. There was no gender differences observed ($p>0.05$)

Table 8 and Graph 8 shows prevalence of others such as Pegs, odontomas supplementary teeth dens invaginatus etc. The overall prevalence was 0.84% there was no significance difference according to gender ($p>0.05$).

Table 1: Distribution of study subjects according to Gender

Gender	Frequency	Percentage
Male	2257	68.13
Female	1056	31.87
Total	3313	100

Table 2: Prevalence of Canine Impaction

Type	Male	Female	Total
Lower Left I	3	0	3
Lower Left II	1	3	4
Lower Left IV	1	0	1
Lower Right and Left	1	0	1
Lower Right I	3	1	4
Lower Right II	3	0	3
Upper Left I	7	0	7
Upper Left II	13	9	22
Upper Left IV	3	5	8
Upper Right I	5	3	8

Upper Right II	4	3	7
Upper Right IV	3	2	5
Upper Right II and Left I	1	1	2
Upper Right and Left I	0	2	2
Upper Right and Left II	0	2	2
Upper Right and Left II and lower Left II	5	0	5
Upper Right and Left II and lower Left II	1	0	1
Upper Right and Left IV	1	1	2
Upper Right II and Left IV	1	0	1
Upper Right I and Left II	1	0	1
Upper Right I and Left IV	1	0	1
Total	58	32	90
Prevalence (Percentage)	2.56	3.03	2.71

$\chi^2 = 0.574$, P = 0.491 Non Significant

Graph 2: Prevalence of Canine Impaction

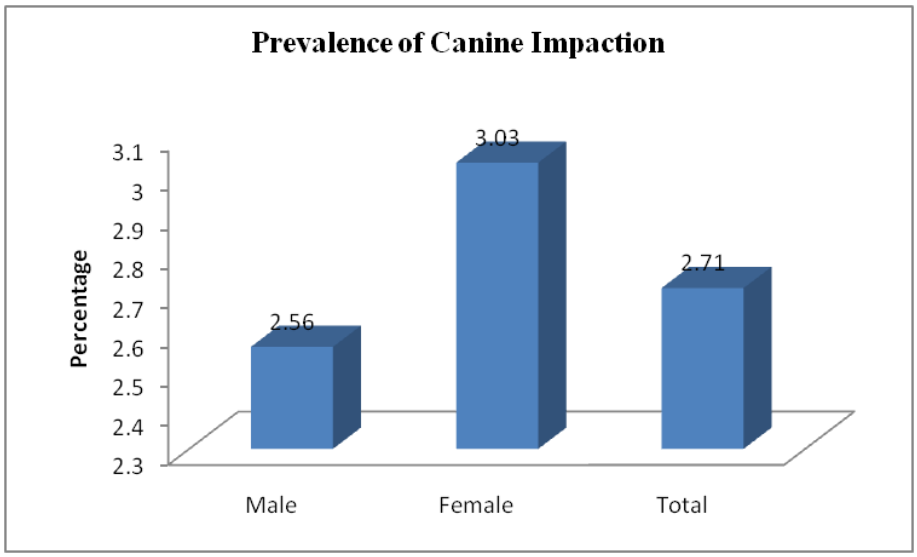


Table 3: Prevalence of Supernumerary Teeth.

Type	Male	Female	Total
Distodens	12	02	14
Impact Mesiodens	01	0	1
Impact Peridens	01	0	1
Distodens Impact	0	01	1
Mesiodens	04	0	4
Peridens	08	0	8
Total	26	03	29
Prevalence (Percentage)	1.15	0.28	0.87

χ^2 = 6.250, P = 0.014 Significant

Graph 3: Prevalence of Supernumerary teeth

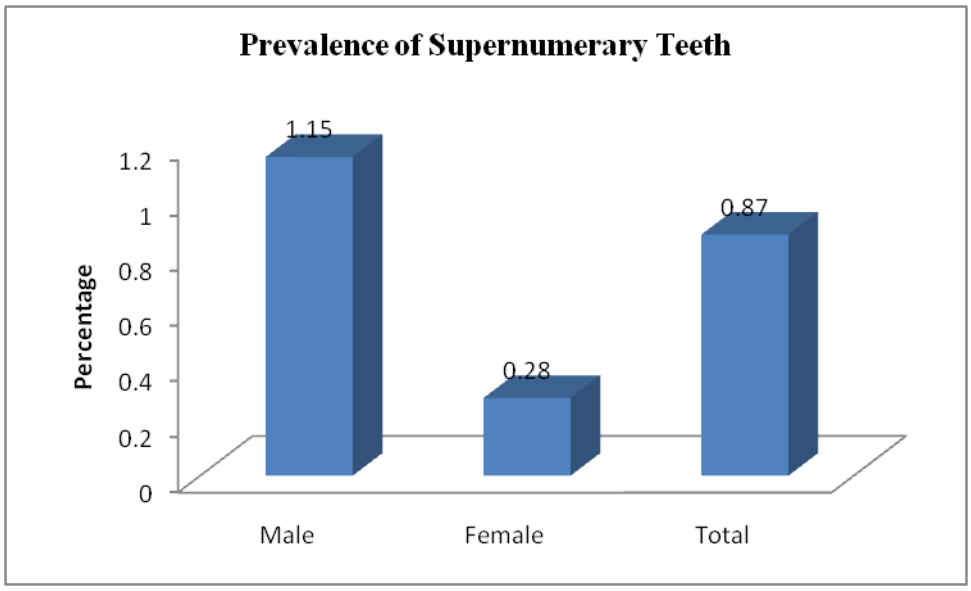


Table 4: Prevalence of dilacerations

Dilacerations	Male	Female	Total
Number	78	15	93
Prevalence	3.45	1.42	2.80

χ^2 = 0.426, P = 0.559 Non Significant

Graph 4: prevalence of Dilacerations

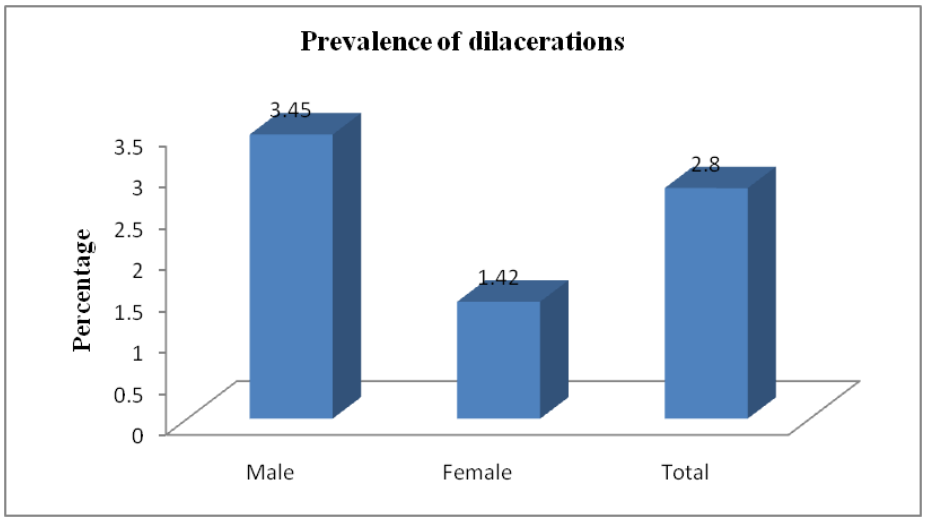


Table 5 Prevalence of Impaction

Tooth Number	Male	Female	Total
11	02	00	02
14	01	00	01
15	03	02	05
21	00	01	01

22	01	00	01
24	01	00	01
25	05	01	06
34	01	01	02
35	07	03	10
37	01	00	01
41	01	00	01
44	01	00	01
45	05	03	08
47	02	00	02
Total	31	11	42
Prevalence	1.37	1.04	1.26

$\chi^2 = 1.564$, P = 0.211 Non Significant

Graph 5: Prevalence of Impaction

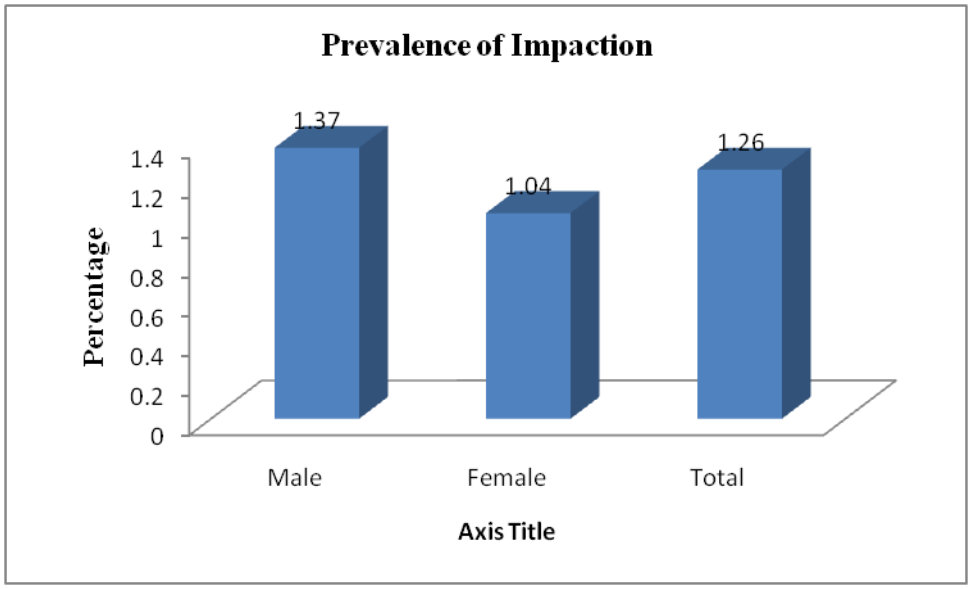


Table 6 Prevalence of Fusions

Fusion	Male	Female	Total
Number	7	0	7
Prevalence	0.31	0	0.21

$\chi^2 = 1.875$, P = 0.171 Non Significant

Graph 6: Prevalence of Fusions

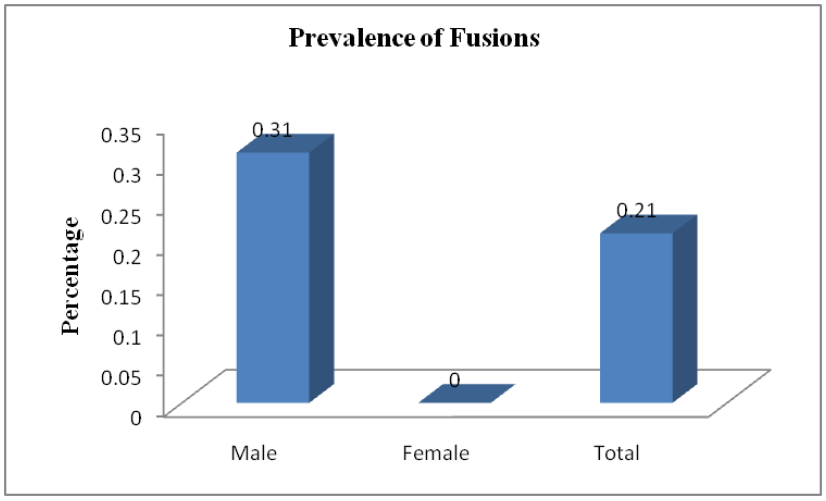


Table 7 Prevalence of congenitally missing teeth

Tooth Number	Male	Female	Total
12	2	00	2
14	1	00	1
15	2	00	2
17	1	00	1
22	03	00	03
23	01	00	1
25	01	00	1
27	01	00	1
34	01	00	1
35	09	07	16
36	01	00	1
37	01	00	1
21	1	00	1
44	2	00	2
45	10	07	17
Total	37	14	51
Prevalence	1.63	1.32	1.53

$\chi^2 = 0.002$, P = 0.964 Non Significant

Graph 7: Prevalence of congenitally missing teeth

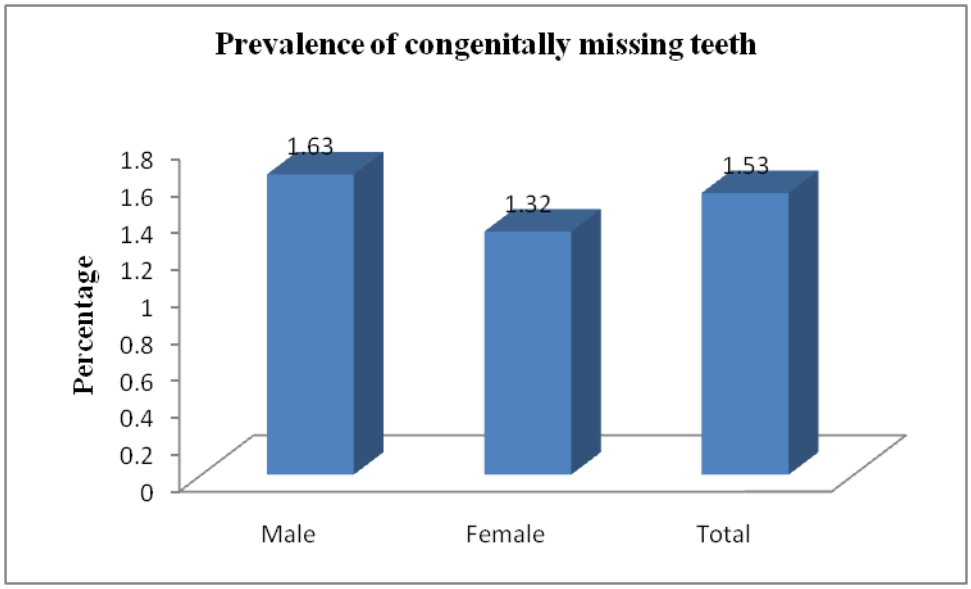
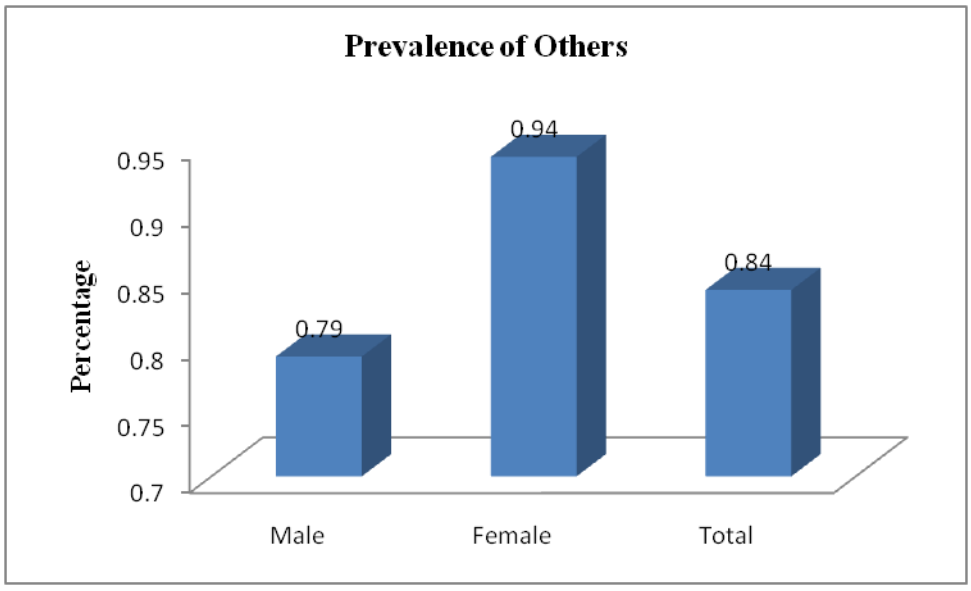


Table 8: Prevalence of Others

Type	Male	Female	Total
Pegs	8	5	13
Odontoma	6	1	7
Dens inv	2	3	5
Supplemental teeth	2	1	3
Total	18	10	28
Prevalence	0.79	0.94	0.84

$\chi^2 = 0.191$, P = 0.662 Non Significant

Graph 8: shows prevalence of others



Discussion

Present study investigated prevalence and distribution of dental developmental anomalies among adult population of Al- Kharj, Saudi Arabia and assessed the difference in prevalence between males and females. Among the total 3313 panoramic radiographs with 2257 males and 1056 females. Most commonly found DDA in present study being dilacerations prevailed in 93 radiographs followed by canine impaction seen in 90 radiographs, congenitally missing tooth in 51 radiographs, impacted tooth other than canine existed in 42 radiographic samples, supernumerary teeth in 29 radiographs, peg laterals in 13 samples, odontomas and fusion in 07 radiographs and dens invaginatus in 05 radiographic samples. Least prevalent anomaly in present study being supplemental tooth existed only in 3 radiographs.

Most commonly prevailed DDA in present study being dilacerations. Dilacerations is best described as an acute angulation involving mostly apical third of the root (Neville BW et al 2013). limited studies have been conducted to assess the prevalence of dilacerations reports ranging frequency from 0.32 to 98 % (Buenviaje T and Rapp R 1984) Further studies also have reported an 98% prevalence of dilacerations with lateral incisors have been documented (Hagman F 1987). However, it is also questionable about 98% prevalence of dilacerations and may not be all the cases represented actual dilacerations than being natural tendency of the apical third of the roots to show distal inclination.

Impaction of canine tooth in present study is found in 90 radiographs comprising 2.7% of total sample and study findings is been consistent with other studies in literature (Thoma KH 1969) Further, no statistically significant difference was found between males and females in the present study.

Congenitally missing tooth leading to hypodontia of the dental arch was noted with prevalence of 1.53% in the present study similar finding was seen in Polder BJ et al 2004 in their study. Most commonly involved tooth being lateral incisors and second premolars in existing study.

Impaction of tooth other than canine was seen in 42 samples making 1.26% of total cases involving 31 males and 11 female respectively. Supernumerary tooth leading to hyperdontia of the dental arches has different descriptive dimensions like Mesiodens, Distodens, paramolar and it can be further diversify into supplemental and rudimentary with additional conical, tuberculate and molariform categorization (Neville BW et al 2013). The prevalence of supernumerary tooth has been notes in literature ranging from 0- 3.8 % (Venkataraghavan K et al 2014) and similar findings has been noted in present study and further statistically significant difference was found between male and female.

The prevalence of the anomalous peg laterals was found to be 13 cases that comprise 0.39% of total examined samples and similar comparable results have been found in studies conducted in American population (Ridell K et al 2001; Anand Tegginamane et al 2012). Fusion is a dental anomaly which had led to diagnostic difficulty to a clinician. In present study seven cases of fusion was recorded. Fusion is generally described as anomalous condition which reveals a missing tooth when anomalous tooth is counted as one (Neville BW et al 2013).

Conclusions:

The prevalence of DDA among adult population in Al – Kharj, Saudi Arabia is found to be 10% in present study and further prospective studies need to be conducted with use of wide array of modalities involving through clinical examination, occlusal radiographs, and intraoral periapical radiographs as only depending on Orthopantomography (OPG) has certain limitations in retrospective assessment and recording. Further research should

be considered for the possible etiological factors of dental anomalies which could be made use for applying preventive strategies.

References

1. Afify AR, Zawawi KH. The prevalence of dental anomalies in the Western region of Saudi arabia. ISRN Dent. 2012; 2012:837270.
2. Anand Tegginamane et al. Gemination, Fusion or Confusion: A tooth Nomenclature Enigma for Fusion, Gemination. Indian J Dent Adv 2012; 4(4): 964-968.
3. Buenviaje T, Rapp R. Dental anomalies in children: A clinical and radiographic survey. ASDC J Dent Child 1984; 51:42-6.
4. Neville BW, Chi AC, Damm DD, Allen CM. Oral and maxillofacial pathology: Elsevier Health Sciences; 2013.
5. Neville DW, Damm DD, Allen CM, Bouquot JE. Abnormalities of teeth Oral and Maxillofacial Pathology. 2nd ed. Philadelphia, PA: Elsevier; 2005. p. 49–89.
6. Hagman F. Anomalies of form and number, fused primary teeth, a correlation of the dentitions. ASDC J Dent Child 1987; 55:359-61.
7. Kositbowornchai S, Keinprasit C, Poomat N. Prevalence and distribution of dental anomalies in pretreatment orthodontic Thai patients. KDJ 2010; 13(2):92–100.
8. Kotsomitis N, Dunne MP, Freer TJ. A genetic aetiology for some common dental anomalies: a pilot twin study. Aust Orthod J 1996;14(3):172–8.
9. Osuji OO, Hardie J. Prevalence of dental anomalies. Saudi Dent J 2002; 14(1):11–4.
10. Polder BJ, Van't Hof MA, Van der Linden FP, Kuijpers-Jagtman AM. A meta-analysis of the prevalence of dental agenesis of permanent teeth. Community Dent Oral Epidemiol 2004;32: 217-26.
11. Ridell K, Mejàre I, Matsson L. Dens invaginatus: A retrospective study of prophylactic invagination treatment. Int J Paediatr Dent 2001;11:92-7.
12. Thoma KH. Oral surgery: Mosby; 1969.
13. Tsai SJ, King NM. A catalogue of anomalies and traits of the permanent dentition of southern Chinese. J Clin Pediatr Dent 1998;22(3):185–94.
14. Venkataraghavan K, Athimuthu A, Prasanna P, Jagadeesh RB. Transposition of mandibular lateral incisor-canine (mn.i2.C) associated with hypodontia: A review and rare clinical case. J Clin Diagn Res 2014;8:ZE04-6.
15. Yaacob H, Nambiar P, Naidu MDK. Racial characteristics of human teeth with special emphasis on the Mongoloid dentition. Malaysian J Pathol 1996;18 (1):1–7.