Republic of Iraq

Ministry of Higher Education

And scientific Research

University of Baghdad

College of Dentistry

Fordyce's granules

A project submitted to the Council of the College of Dentistry at the University of Baghdad, Department of Oral Medicine, in partial fulfillment of the requirement for B.D.S. degree

Done by:

Zahraa Fakher Abd_Algany

Supervisor

RanaMurtadha Hassan

(B.D.S., M.Sc)

2017-2018

List of content

List of figure

(1-3)	Sebaceous glands in the dermis on the lip	10
(1-4)	Multiple yellow papules in the upper lip	12
(1-5)	Immediately after the procedure with CO2	12
(1-6)	Final result after one year	13
(1-7)	Hundreds of 0.5- to 1-mm yellowish papules are present over the upper lip	14
(1-8)	A frosty white appearance is seen within seconds of application of bichloracetic acid to this test area.	15
(1-9)	Four weeks after final bichloracetic acid application	15
(1-10)	Minute yellowish pinhead-sized macules on the before 5-aminolaevulinic acid– photodynamic	16
(1-11)	Mild improvement in the same patient after nine sessions of treatment	16
(3-1)	prevalence of Fordyce's granules according to age	20

List of table

Introduction

The sebaceous glands are microscopic exocrine (Holocrine) glands in the skin that secrete sebum, an oily or waxy substance. Their functions include mainly lubrication and diminishing water permeability of surrounding skin, hair, eyelids

and areola. Physiologically their function allows delaying dehydration in hot conditions, where as in colder condition, the sebum produces a lipid coating that repels water. Natural photo protection, and anti-inflammatory skin properties, It primarily contains triglycerides, wax esters, Squalene and free fatty acids **(Olivier, 2006)(James et al, 2006)(Ahmed ,2009).**Sebaceous glands are normal adnexal structures of the skin, but may also be found within the mouth, where they are referred to as Fordyce's granules or heterotopic/ectopic sebaceous gland **(Neville et al, 2009).** The granules were initially described by Kölliker in 1861, but are named after Fordyce who reported on the same problem in 1896**(Bork et al, 1996).**Although Fordyce felt that the presence of the phenomena was a sign of a disease, most of the clinicians today consider them as a normal variation made up by collections of sebaceous glands covered with intact mucosa **(Neville et al, 2003) (Antonio, 2003).** Most patients are asymptomatic; therefore, demand for treatment is not high. However, some patients consider receiving treatment for cosmetic reasons since the lesions do not resolve spontaneously **(Kim et al, 2007).**

Aim of study

The aims of this study were to assess the prevalence of Fordyce's granules in a group of dental patients and to investigate the distribution of Fordyce's granules according to gender, age and geographic area.

Chapter one

Review of literature

1.1 oral cavity

The oral cavity represents the first part of the digestive tube. Its primary function is to serve as the entrance of the alimentary tract and to initiate the digestive process by salivation and propulsion of the alimentary bolus into the pharynx **(Probst et al, 2006).**

It also serves as a secondary respiratory conduit, a site of sound modification for the production of speech, and a chemosensory organ

(Water and Staecker , 2006). The oral cavity is oval shaped and is separated into the oral vestibule and the oral cavity proper **(Snow et al,2009).** Bound by the lips anteriorly, the cheeks laterally, the floor of the mouth inferiorly, the oropharynx posteriorly, and the palate superiorly **(Probst et al ,2006).** The oropharynx begins superiorly at the junction between the hard palate and the soft palate, and inferiorly behind the circumvallate papillae of the tongue**.** (**Edge, 2010)** . The bony base of the oral cavity is represented by the maxillary and mandibular bones **(Szpirglas , 1999).**

1.2 Definition

Fordyce spots are enlarged sebaceous glands located most commonly on the lips, adjacent to the vermilion border, and on the oral mucosa. **(Woo, 2004).**

Manifested as small whitish or yellowish papules that are confluent and that occasionally form plaques **(Drore and Sexton,1996).** Although these glands have been historically regarded as ectopic, they should be considered a variation of normal anatomy **(Woo, 2004).**

1.3 Epidemiology

There are considerable controversies as to the prevalence of Fordyce's granules in the oral cavity. It is estimated that about 80% of people have oral Fordyce's spots but rarely are granules found in large numbers. **(Scully, 2013).**Previous studies reported Fordyce's granules are not usually visible in children, and tend to appear at about age 3, then during puberty and become more obvious in later adulthood **(Scully, 2013**). It has also been previously reported that the incidence of Fordyce's spots increased with age, and 60~80% of patients were elderly **(Choudhry et al, 1992).**Some studies reported they are more prominent in males. **(Lee et al,2012).** And some studies reported no significant difference in the prevalence between males and females **(Olivier , 2006).**And some estimated that The male to female ratio is approximately 2:1**(Baeder et al ,2010)**.High prevalence of Fordyce's granules was seen in 3rd and 4th decades in males whereas in females the prevalence was high in 4th and 5th decades **(Palo, 2006).**

1.4 etiology

A Fordyce spot is a type of oily gland that has appeared in an unusual location on the body. It is not known what causes Fordyce spots, but some studies have linked their development to hormonal changes Genetic link has been suggested to be etiologically relevant in Fordyce's granules. **(Lee et al, 2012).** Similarly it has been suggested that these granules have idiopathic etiology and they are not known to be associated with any disease or illness and are of cosmetic concern only. While, some authorities are of the belief that Fordyce's spots are also seen in some rheumatic disorders and in hereditary non-polyposis colorectal cancer syndrome**(Felice et al, 2005).**

1.5 Classification

Sebaceous glands are normal structures of the skin but may also be found ectopically in the mouth, where they are referred to as *oral Fordyce granules* or ectopic sebaceous glands **(*Khoo and Cheong ,1995).*** When they appear on the penis, they are also called *penile sebaceous glands* **(*Rane and Read ,2013).*** When seen as a streak of individual glands along the interface between the skin of the lip and the vermilion border, the terms Fox–Fordyce disease and Fordyce's condition have been used.

1.6 Clinical

Fordyce spots are visible sebaceous glands that are present in most individuals. which are seen in the oral cavity as small, painless, raised, yellowish or white spots of 1 to 3 mm in diameter**(James et al,2006).**The common site for occurrence of Fordyce's granules has been suggested as vermillion border and lips (Fig 1) **(Scully ,2013).** On the other hand buccal mucosa particularly inside the commissures and retro molar region has also been suggested as common site. They may also appear on the scrotum, shaft of the penis or on the labia **(James et al, 2006).** The lesions are usually bilateral and symmetrical. **(Baeder, 2010)(Mansur and Aydingoz, 2012)**A thick, chalky or cheesy material can sometimes be expressed by squeezing the lesion (**Rane and Read, 2013).**

Only the sebaceous glands that are visible through the epithelium should be considered Fordyce granules **(Dreher and Grevers ,1995).**Their frequency increases with age Even though the sebaceous glands are present since birth, this condition is not common before puberty, developing during this period in response to the gonadal and adrenal androgenic hormones **(Elder et al,1997) (Dover et al ,1996).** Some patients will have hundreds of granules while most have only one or two. Occasionally, several adjacent glands will coalesce into a larger cauliflower-like cluster similar to sebaceous hyperplasia of the skin.

Fig (1-1): Multiple pin sized yellowish spots on upper lip and buccal mucosa **(Shahzad et al, 2015).**

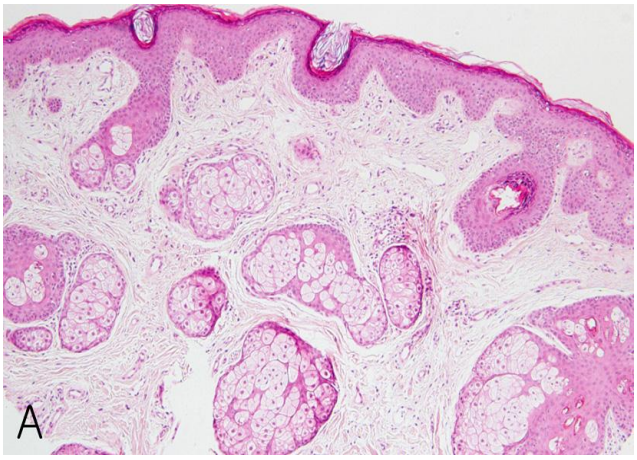
Figure (1-2) Fordyce spots on the upper lip **(Leung and Barankin, 2015).**

1.7 Histology

The soft tissues of the human oral cavity are covered by a stratifying squamous epithelium **(Squier and Hill,1989).**In regions subject to mechanical forces associated with mastication (i.e., the gingiva and hard palate) there is a keratinizing epithelium resembling that of the epidermis covering the skin. In these masticatory mucosae, the keratinized epithelium is tightly attached to the underlying tissues by a collagenous connective tissue, or lamina propria. The floor of the mouth, buccal regions, which require flexibility to accommodate chewing, speech, are covered with a non keratinizing epithelium. The connective tissue of lining mucosae is more elastic and flexible than the connective tissue in the masticatory mucosa. In many regions, such as the cheeks, the lips, and parts of the hard palate, a layer of loose fatty or glandular connective tissue containing the major blood vessels and nerves supplying the mucosa separates the oral mucosa from underlying bone or muscle. This represents the sub mucosa in the oral cavity, and its composition determines the flexibility of the attachment of the oral mucosa to underlying structures. The dorsum of the tongue is covered by a specialized epithelium, which can be represented as both of keratinized and nonkeratinized epithelium. . From measurements made by Collins and Dawes ***(*** **Collins and Dawes , 1987).** it can be calculated that the masticatory mucosa represents approximately 25%, the specialized mucosa (dorsum of tongue) approximately 15%, and the lining mucosa approximately 60% of the total surface area of the oral lining.

For Fordyce's granule which is ectopic variation of normal sebaceous glands in oral cavity. Usually not biopsied because they are readily diagnosed clinically, but they are often seen as incidental findings of mucosal biopsies of the buccal, labial and retro molar mucosa. These glands, present in 80 to 95% of adults, along the

same lines, these spots are neither a disease, a lesion or an adenoma. These glands are acino-tubular and distributed in clusters. The granules are similar to normal sebaceous glands of the skin but lack hair follicles and almost always lack a ductal communication with the surface. The glands are located just beneath the overlying epithelium and often produce a local elevation of the epithelium. the acinous cells can be artificially classified in three groups: basal germinative cells partially differentiated intermediary cells and totally differentiated preductal cells Individual sebaceous cells are large, with central dark nuclei and abundant foamy cytoplasm. The surrounding stroma may contain occasional chronic inflammatory cells because of trauma with adjacent teeth.



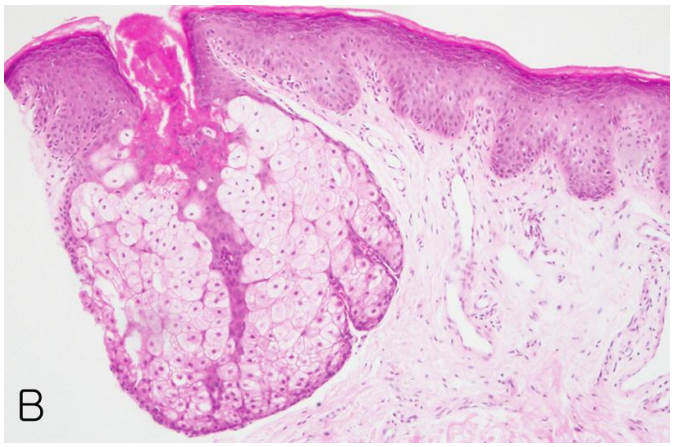


Fig.(3-1). Sebaceous glands in the dermis on the lip A) (B). Fordyce's spots open directly onto the surface and do not associate with hair follicles (H&E, ×100) **(Lee et al,2012).**

1.8 Complications

Fordyce spots can be cosmetically unsightly. Rarely, penile lesions may cause discomfort during sexual intercourse **(Pallua and Stromps ,2013).**Usually, they are of no clinical significance and are not associated with systemic disease. A recent study showed that individuals with elevated lipid profile tend to have higher numbers of oral Fordyce spots **(Gaballah and Rahimi ,2014).**

1.9 Prognosis

Fordyce spots are completely benign **(Scully, 2013).** and require no treatment. Often their presence is considered normal anatomic variance rather than a true medical condition

1.10 Diagnosis and Treatment

In most cases clinical features are characteristic enough to diagnose Fordyce's spots easily without histopathological examination **(Ocampo-Candiani et al ,2003).** Fordyce spots are asymptomatic and no treatment is recommended for the vast majority of patients. Malignant transformation has not been reported, and there is no association with any systemic disease **(Elston et al ,2001) .**Often, reassurance about the benign nature of the condition is all that is necessary, although The Treatment may be demanded by the patient for cosmetic reasons since the lesion does not resolve. Carbon dioxide laser and oral isotretinoin or 5-aminolevulinic acid – Photodynamic therapy and chemical cauterization are some of the options for such cases **(Kim et al, 2007)(Baeder et al,2010).**

1.10.1 Treatment of Fordyce Spots With CO2 Laser

CO2 laser is the most versatile. It is used as a cutting instrument or
as a scalpel, causing ablation and tissue vaporization, allowing hemostasis during procedure, minimum edema, and postoperative pain **(Glassberg et al ,1996)(Alster and West ,1996).** The CO2 laser has a 10,600nm wavelength, which is located in the distant spectrum of the infrared band. It has been used for over 30 years in surgeries due to its efficiency in vaporizing and cutting tissues, and for producing an effective intraoperative hemostasis **(Ocampo-Candiani et al ,2003).** use super pulsed CO2 Laser with prior regional block and local infiltration with 2% lidocaine and 1:100,000 epinephrine. A 5W power level with a 2mm spot size was applied in two passes, with the necrotic tissue being removed with moistened gauze in approximately ten days there was local re-epithelialization of the area. After one year there was no recurrence in the treated area, with satisfactory

aesthetic results, the CO2 laser is a good alternative for the treatment of Fordyce granules. it is considered a therapeutic option, offering minimum scars, less pain, shorter healing time, and good cosmetic. **(Fitzpatrick et al ,1994)(Alster and West ,1996).**

FIGURE (1-4): Patient 1 – Multiple yellow papules in the upper lip **(Teixeira et al, 2013).**

FIGURE(5-1): Patient 1 – Immediately after the procedure with CO2 laser **(Teixeira et al , 2013).**

Figure (6-1):Patient 1 – Final result after one year**(Teixeira et al , 2013).**

1.10.2 bichloracetic acid

its chemical cautery agent, bichloracetic acid (BCA; bichloracetic acid is called dichloroacetic acid by some manufacturers)

The application of BCA for Fordyce spots was suggested because of successes in treating benign sebaceous hyperplasia **(Rosian et al ,1991).** BCA is effective at treating these conditions and destroying Fordyce spots because the acid acts as a nonspecific chemical cauterant destroying the lipid within these lesions and small amounts of associated protein. **(Rosian et al ,1991).** An excellent cosmetic result is reported after treatment with bichloracetic acid

1.10.2.1 The Advantages of bichloracetic acid treatment

1-simplicity; BCA application can be performed quickly

And easily and requires no special technical skills.

2-the treatment is cost-effective compared to laser

3- It has been used safely for years in the treatment of various skin lesions **(Haygood et al, 1998).**

1.10.2.2 Risk of bichloracetic acid treatment

1-The physician must take great care in application to avoid dripping or splashing the acid into the eyes.

2-BCA could result in scarring, especially if secondary infection occurs.

(Haygood et al,1998).

3-Postinflammatory hypopigmentation and hyperpigmentation are also risks.

The application of topical antibiotic ointments post treatment

to keep the wound bed moist until healing has occurred is recommended to reduce these risks.

Figure (7-1). Hundreds of 0.5- to 1-mm yellowish papules are present over the upper lip **(PLOTNER et al , 2008).**

Figure (8-1). A frosty white appearance is seen within seconds of application of bichloracetic acid to this test area**. (PLOTNER et al, 2008).**

Figure (9-1): Four weeks after final bichloracetic acid application showing the appearance of the upper lip after treatments have been completed. Eighty to 90% improvement is noted without any significant scarring **(PLOTNER et al, 2008).**

1.10.3 5-aminolevulinic acid photodynamic therapy

Photodynamic therapy (PDT) is a treatment modality which involves the sequential administration of a photosensitizer or photosensitizer precursor, and light **(Divaris et al ,1990)**. 5-aminolevulinic acid photodynamic therapy to treat Fordyce spots. Unfortunately, these patients suffered poor result and significant side effects

including painful swelling, vesiculation, and post inflammatory, hyperpigmentation, with only mild clinical improvement after several sessions. **(Kim et al ,2007).**

1.10.3.1 Low cure rate in Fordyce spots by 5-aminolevulinic acid photodynamic therapy is caused by:

1- Because Fordyce spots present simply as ectopic variants of normal sebaceous glands, not tumors, they are likely to show less proliferation **(Ashkenazi et al ,2003).**

2-Another possible explanation is related to the mucosal location of Fordyce spots. Regeneration of mucosal epithelium is faster than that of skin **(Shannon et al 2006).** and the rapid recovery of normal anatomical structures in partially damaged sebaceous glands after PDT may make difficult to complete destruction of sebaceous glands

Figure(10-1). Minute yellowish pinhead-sized macules on the before 5-aminolaevulinic acid– photodynamic therapy **(KIM et al, 2006).**

Figure(11-1) Mild improvement in the same patient after nine sessions of treatment **(KIM et al, 2006).**

Chapter two:

Materials and methods

During this study, 200 dental patients attending the hospital of Collage Of Dentistry, University Of Baghdad in Baghdad city, were examined for the presence of Fordyce's granules. The study was conducted from January, 2018 to March, 2018 by a single investigator. The ages of the examined subjects range from 18 to 60 years. All the patients were accessible at the hospital for regular checkup and dental treatment. A detailed history regarding the demographic data, and geographic data was recorded. The subjects were seated on the dental chair and were examined using sterile gloves, mouth mirror under illumination with dental chair light. Study subjects were asked to open the mouth and slightly retract the lips .The mouth was examined for cheek, upper lip, lower lip, soft palate and retro molar area. Collected data were recorded on paper forms in index 1 and then entered, processed and analyzed using Microsoft Excel 2010.

Chapter Three

RESULTS

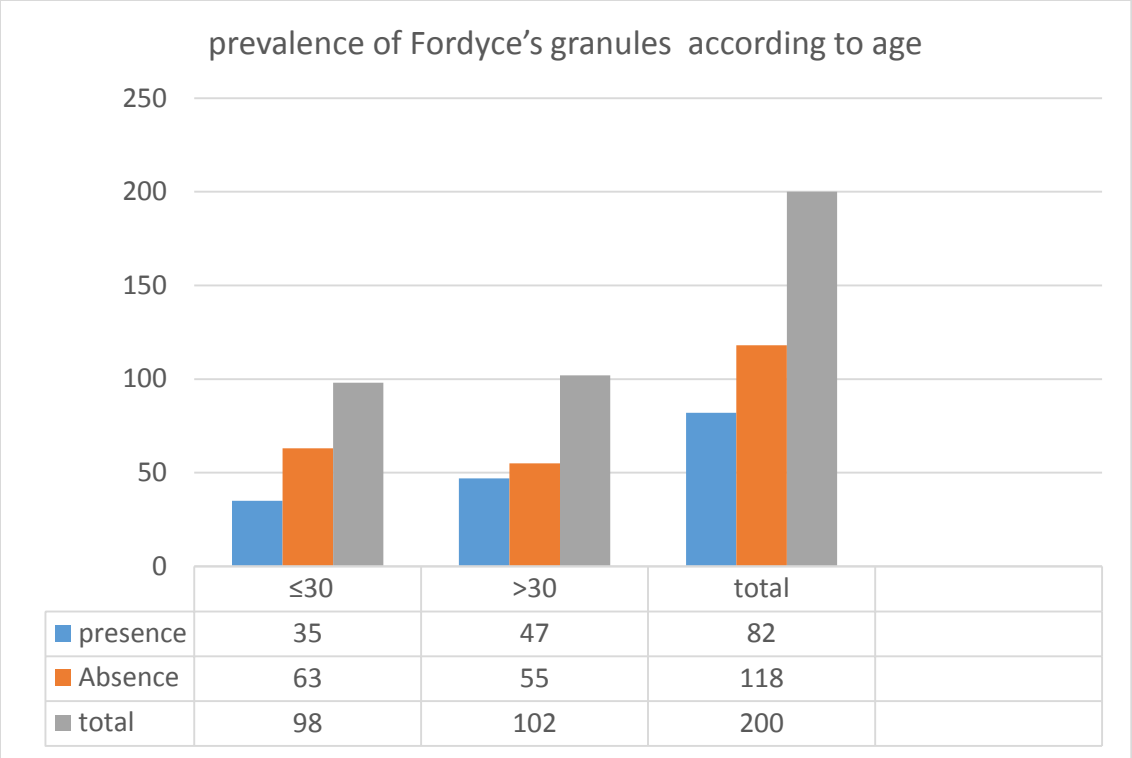
3.1 Age:

A total of two hundred subjects have been examined and 82 subject had Fordyce's granules according to age the subject grouped into two age groups, the first group ≤30 years contain 98 examined subjects and about 36% subject were affected with Fordyce's granules, and about 64% subject without granules .the second group >30year contain 102examined subjects and about 46% of the subject were affected with Fordyce's granules and about 54% were not contain granules.

Table 3-1: prevalence of Fordyce's granules according to age groups

age group	**Fordyce's granules**				Total	
	presence		Absence		No.	%
	No.		No.	%		
≤30	35	36%	63	64%	98	100%
>30	47	46%	55	54%	102	100%
total	82	41%	118	59%	200	100%

Table 3-2 distribution of Fordyce's granules according to age groups			
Age groups			Mean age
	NO.	%	
≤ 30	35	43%	22.96
>30	47	57%	43.74
total	82	100%	66.7



Figure(3-1) prevalence of Fordyce's granules according to age

3.2 Gender:

A total number of one hundred twenty females have been examined and about 50 of the affected subject had Fordyce's granules (61%) and a total number of eighty males have been examined and found that about 32 of the affected subject were with Fordyce's granules .(39%)

Table 3-3: prevalence of according Fordyce's granules to gender

gender	Total no.	Percenta	no. of disorder	Percent	Mean age

	of cases	ge %	cases	age %	
female	120	60%	50	61%	36.08
Male	80	40%	32	39%	32.96
Total	200	100%	82	100%	69.04

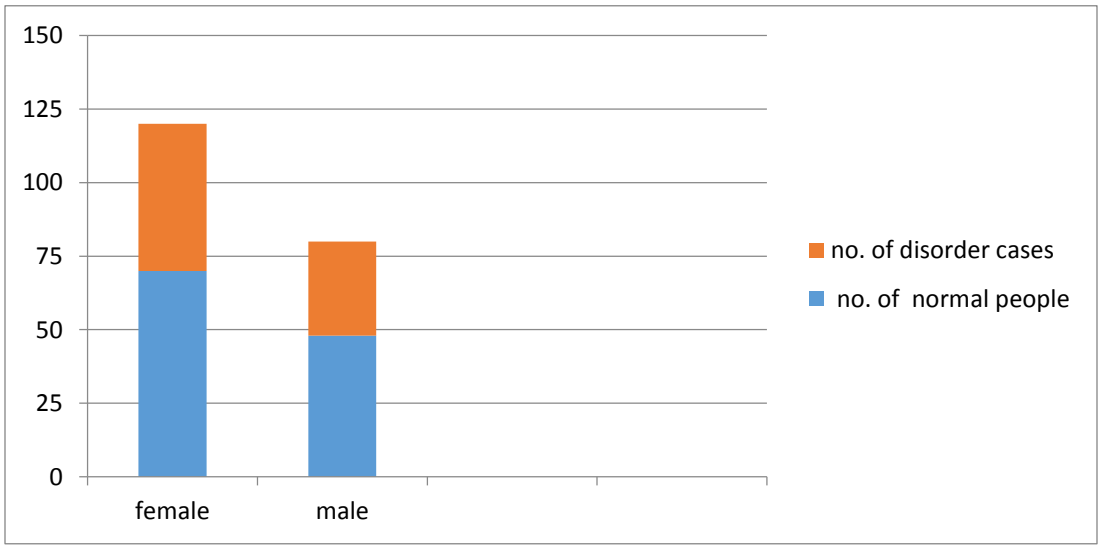


Figure (3-2) prevalence of Fordyce's granules according to gender

3.3 site:

The retro molar area was the most affected site for the presence of Fordyce's about 41% Followed by upper lip then lower lip 20% and palate 13%the smallest percentage of cases was in the Buccal mucosa about 6%

Table 3-4 the prevalence of Fordyce's granules according to site.		
Site	No.	%
Retro molar	34	41%
Upper lip	16	20%
Lower lip	16	20%
Soft Palate	11	13%
Buccal mucosa	5	6%
Total	82	100%

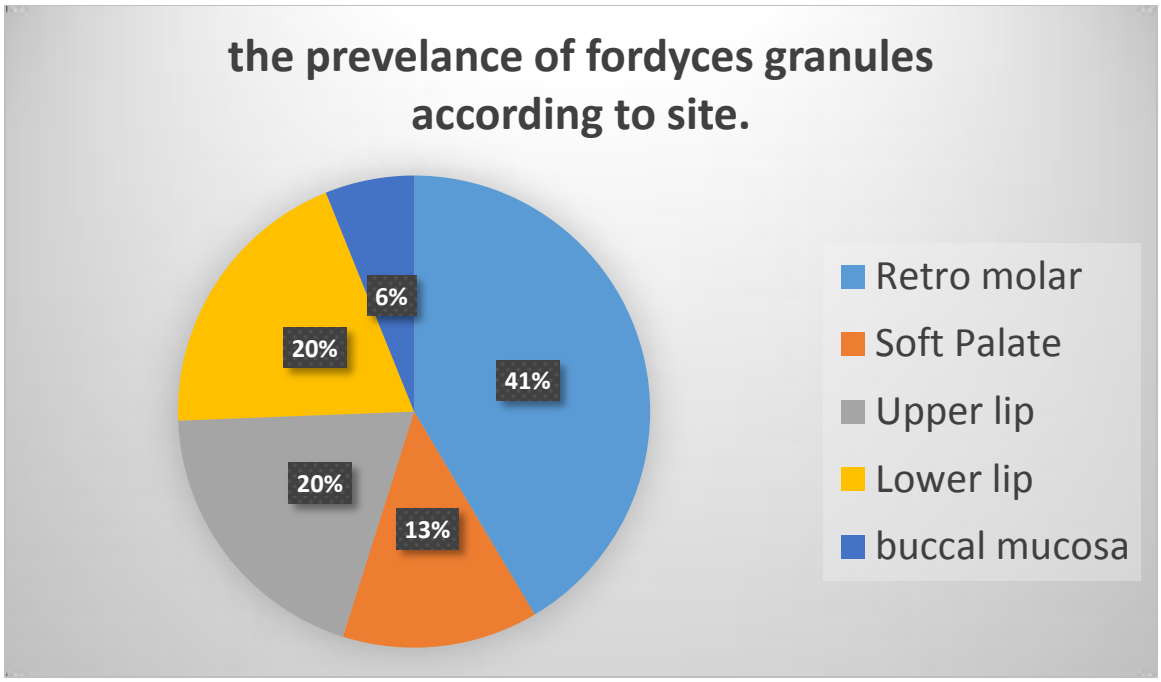


Figure (3-3) the prevalence of Fordyce's granules according to site.

3.4 Geographic:

Baghdad was the most common city for the prevalence of Fordyce's granules about 51% followed by Basrah 9%, Mosul and Diyala 7%, Anbar and Maysan 6%, Thi qar and Babylon 5% and then Karbala 4%.

Table 3-5 The prevalence of Fordyce's granules according to geographic data

city	No. of patient	%
Baghdad	42	51%
basrah	7	9%
diyala	6	7%
mosul	6	7%
maysan	5	6%
anbar	5	6%
thi qar	4	5%
Babylon	4	5%
Karbala	3	4%
Total	82	100%

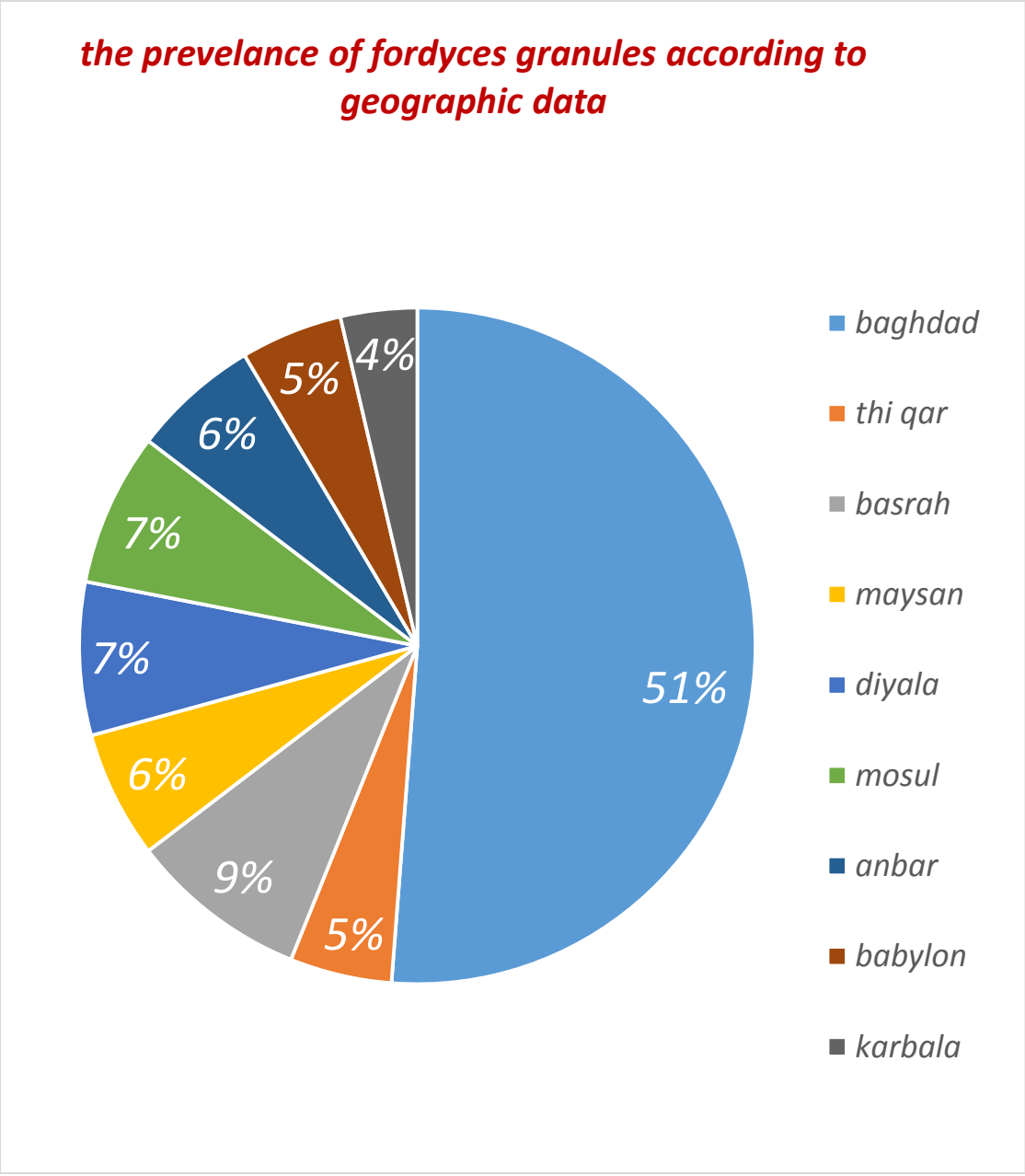


Figure (3-4) ***the prevalence of Fordyce's granules according to geographic data.***

Chapter Four

Discussion

4.1 Age:

Fordyce's granules are not usually visible in children, tend to appear during puberty and become more obvious in later adulthood, it has also been previously reported that the incidence of Fordyce's spots increased with age in response to the gonadal and adrenal androgenic hormones. In this study43% of the affected people were ≤30 years and 57% of the affected people were >30 years, this finding was in agreement with **(Elder et al, 1997)(Dover et al, 1996) (Scully, 2013) (Choudhry et al, 1992).** Who were reported that the incidence of Fordyce's granules increased with age.

4.2 site

Fordyce's spots are ectopic sebaceous glands and normal physiological variant in the oral cavity, the vermilion border of the upper lip is the most common site of lesions. In this study, 41 % Fordyce's granules were found on the retro molar pad area followed by 20 % on upper and lower lip, 13% on soft palate area, and 6% on the buccal mucosa. And this finding was in disagreement with **(Scully, 2013).** Who has been suggested that the vermillion border and lips was the common site for occurrence of Fordyce's granules .

4.3 Geographic

In this study Baghdad was the most prevalence city in the presence of Fordyce's granules about 51% of cases was in Baghdad because of population density in Baghdad city compare to other cities.

Chapter five

Conclusion

- Most patient with Fordyce's granules are older than 30 years of age about
- The retro molar pad area is more prone to Fordyce's granules than other site in the oral cavity

References

❖ **A**

- ❖ Ahmed TSS, Priore JD, Seykora JT. Tumors of the appendages. In: Elder DE, Elenitsas R, Johnson BL, Murphy GF, editors. Lever's histopathology of the skin. 10th Ed. Philadelphia: Lippincott Williams & Wilkins; 2009. Pp. 872-873.
- ❖ ALISHA N. PLOTNER, BS, AND ROBERT T. BRODELL, MD2008 by the American Society for Dermatologic Surgery, Inc. Published by Blackwell Publishing
- ❖ Alster TS, West TB. Ultrapulse CO2 laser ablation of xanthelasma. J Am acaddermatol 1996;34:848–9.
- ❖ Ashkenazi H, Malik Z, Harth Y, Nitzan Y. Eradication of Propionibacterium acnes by its endogenic porphyrins after illumination with high intensity blue light. FEMS immunolmed Microbiol 2003; 35:17–24.

❖ **B**

- ❖ Baeder FM, Pelino JE, de Almeida ER, Duarte DA, Santos MT (2010) High-power diode laser use on Fordyce granule excision: a case report. J cosmetdermatol 9: 321-324. [Crossref]
- ❖ Bork K, Hoede N, Korting G, Burgdorf WH, Young SK. 2nd ed. Philadelphia: WB Saunders; 1996. Diseases of the Oral Mucosa and the Lips; pp. 240–1.

❖ **C**

- ❖ Choudhry R, Hodgins MB, Van der Kwast TH, Brinkmann AO, Boersma WJ. Localization of androgen receptors in human skin by immunohistochemistry: implications for the hormonal regulation of hair growth, sebaceous glands and sweat glands. J Endocrinol. 1992;133:467–475.
- ❖ Collins LM, Dawes C. The surface area of the adult human mouth and the thickness of the salivary film covering the teeth and oral mucosa. J Dent Res1987;66:1300–2.

❖ D

- ❖ De Felice C, Parrini S, Chitano G, Gentile M, Dipaola L, Latini G 2005, fordyces granules and hereditary non-polyposis colorectal cancer syndrome. Gut 54(9): 1279-82. Epub 2005 May 6
- ❖ Dover J, Arndt K, leboit PE, et al. Pocket Guide to Cutaneous Medicine and Surgery. Philadelphia: WB Saunders, 1996:513–31
- ❖ Dreher A, Grevers G. Fordyce spots. A little regarded finding in the area3. Of lip pigmentation and mouth mucosa. Laryngorhinootologie. 1995;74(6):390-2.
- ❖ Drore E, Sexton J. Disorders of oral membranes. In: Arndt KA, LeBoit PE, Robinson JK, et al. Cutaneous Medicine and Surgery. Philadelphia: WB Saunders, 1996;2:1323–39.

❖ E

- ❖ Edge SB, American Joint Committee on Cancer. *AJCC Cancer Staging Manual*. 7th ed. New York: Springer; 2010.
- ❖ Elder D, Elenistas R, Ragsdale BD. Tumors of the epidermal appendages. In: Elder D, Elenistas R, Jaworsky C, et al., eds. Lever's Histopathology of the Skin, 8th ed. Philadelphia: Lippincott-Raven, 1997:747–803.
- ❖ Elston DM, Meffert J. Photo quiz. What is your diagnosis? Fordyce spots. Cutis 2001;68:24, 49

❖ F

- ❖ Fitzpatrick RE, Goldman MP, Ruiz-Esparza J. Clinical advantage of CO2 laser superpulsed mode. J dermatolsurgoncol 1994;20: 449–56. 14. Alster TS, West TB. Ultrapulse CO2 laser ablation of xanthelasma. J Am acaddermatol 1996;34:848–9.

❖ G

- ❖ Gaballah KY, Rahimi I (2014) Can presence of oral Fordyce's granules serve as a marker for hyperlipidemia? Dent Res J (Isfahan) 11: 553-558. [Crossref]

❖ Glassberg E, Walker K, Lask G. Laser in Dermatology. In: Lask GP, Moy RL, eds

❖ H

❖ Haygood LJ, Bennett JD, Brodell RT. Treatment of xanthelasmapalpebrarum with bichloracetic acid. Dermatolsurg 1998;24:1027–31.
❖ Hyun Lee, M.D., jihae Lee, M.D., Na Hyun Kwon, M.D., Dong Soo Yu, M.D., Gyong Moon

❖ J

❖ James WD, Berger TG, Elston DM. Andrew's disease of the skin. Clinical dermatology. 10th Ed. Philadelphia: WB Saunders; 2006: 800.
❖ James, William; Berger, Timothy; Elston, Dirk (2006). Andrews' Diseases of the Skin: Clinical Dermatology. (10th ed.). Saunders. ISBN 0-7216-2921-0.
❖ Ji Hyun Lee, MD, jihae Lee, MD, Na Hyun Kwon, MD, Dong Soo Yu, MD, Gyong Moon Kim, MD, Chul Jong Park, MD, jeongdeuk Lee, MD, Si Yong Kim, MD. Ann Dermatol Vol. 24, No. 1, 2012.

❖ K

❖ Khoo LS, Cheong WK (July 1995). "Common genital dermatoses in male patients attending a public sexually transmitted disease clinic aka(DC) in Singapore". Annals of the Academy of Medicine, Singapore. 24 (4): 505–9. PMID 8849177.
❖ Kim YJ, Kang HY, Lee ES, Kim YC. Treatment of Fordyce spots with 5-aminolaevulinic acid-photodynamic therapy. Br J Dermatol 2007;156:399–400.
❖ Kim, M.D., Chul Jong Park, M.D., jeongdeuk Lee, M.D., Si Yong Kim, Clinicopathologic Manifestations of Patients with Fordyce’s Spots 2012

❖ L

❖ Leung AKC, Barankin B (2015). Fordyce Spots. Clin Case Rep Rev 1: doi: 10.15761/CCRR.1000140

❖ **M**

❖ Mahreen shahzad ,yousuf moosa ,abdul wahab jehangir prevalence of fordyce's granules — a karachi sample pakistan oral & dental journal vol 35, no. 2 (june 2015)

❖ Mansur AT, Aydingoz IE (2012) Unilateralbuccalfordyce spots with ipsilateral facial paralysis: a sign of neuro-sebaceous connection? Actadermvenereol 92: 177-178. [Crossref]

❖ **N**

❖ Neville B, Damn D, Allen C, Bouquet J. 3rd ed. Philadelphia: Saunders Elsevier; 2009. Oral and Maxillofacial Pathology; pp. 7–8.

❖ Nordstrom KM, mcginley KJ, Lessin SR, Leyden JJ. Neutral lipid composition of Fordyce's granules. Br J Dermatol. 1989;121:669–70. [pubmed]

❖ **O**

❖ Ocampo-Candiani J, Villarreal-Rodriguez A, Quinones-Fernandez AG,7. Herz-Ruelas ME, Ruiz-Esparza J. Treatment of Fordyce spots with CO2 laser. Dermatol Surg. 2003; 29(8): 869-71

❖ Olivier JH. Fordyce granules on the prolabial and oral mucous membranes of a selected population. SADJ.2006; 61: 072-074

❖ **P**

❖ Pallua N, Stromps JP (2013) Micro-punch technique for treatment of Fordyce spots: a surgical approach for an unpleasant condition of the male genital. *J Plast Reconstr Aesthet Surg* 66: e8-11.

❖ Palo Alto Medical Foundation Bettina mcadoo, MD. Retrieved June 24, 2006.

❖ Principles and Techniques of Cutaneous Surgery. New York: mcgraw-Hill, 1996:445–67.

❖ Probst R, Grevers G, Iro H. Stuttgart. *Basic Otorhinolaryngology: A Step-by-Step Learning Guide*. Vii. New York: Georg thiemeverlag; 2006.

❖ **R**

❖ Rane V, Read T (May 2013). "Penile appearance, lumps and bumps". Australian Family Physician. 42 (5): 270–4. PMID 23781523

❖ Rosian R, Goslen JB, Brodell RT. The treatment of benign sebaceous hyperplasia with the topical application of bichloracetic acid. J dermatolsurgoncol 1991;17:876–9

❖ **S**

❖ Scully C (2013). Oral and maxillofacial medicine: the basis of diagnosis and treatment (3rd ed.). Edinburgh: Churchill Livingstone. Pp. 170, 392. ISBN 978-0-7020-4948-4.

❖ Shannon DB, mckeown ST, Lundy FT, Irwin CR. Phenotypic differences between oral and skin fibroblasts in wound contraction and growth factor expression. Wound Repair Regen 2006; 14:172–8.

❖ Snow JB, Wackym PA, Ballenger JJ. *Ballenger's Otorhinolaryngology: Head and Neck Surgery*. 17th. Shelton, Conn. ; Hamilton, Ont. ; London: People's Medical Pub. House/B C Decker; 2009.

❖ Squierca,hillmworalmucr,editor. Oral histology: development, structure and function. St. Louis (MO): CV Mosby; 1989. P. 341–81.

❖ **V**

❖ Van De Water T, Staecker H. *Basic Science Review for Otolaryngology*. New York: Thieme; 2006.

❖ **W**

❖ Woo SB. Disorders of oral mucosa. In: Barnhill RL, Crowson AN, editors. Textbook of dermatopathology. 2nd ed. New York: mcgraw-Hill; 2004. P. 999–1016

❖ **Y**

❖ Y.J. KIM H.Y. KANG E-S. LEE Y.C. kimtreatment of Fordyce spots with 5-aminolaevulinic acid–photodyn