MASTER THESIS

Skin Type related differences of Seborrheic Keratosis

Submitted by:

Dr.Sharifa Aldosari

For the academic degree

Master of Science (MSc)

At the

Medical University of Graz

Executed as part of the

University Training Course Master of Science in Dermoscopy and Preventive Dermato-oncology

Under the supervision of

Professor Rainer Hofmann

Graz, December 1st, 2022

Contents

DECLARATION

I declare on my word of honor that I have written the present work independently, and without external assistance, I have not used sources other than those indicated, and that I have marked the passages taken from the sources used, either literally or in terms of content, as such.

Name: Dr.Sharifa Aldosari

Date: December 1st 2022

Skin type-related differences of Seborrheic Keratosis

Background

Seborrheic Keratosis is an epidermal tumor common in the human skin, mostly in elderly and middle age individuals. The lesions are the common types of tumors found in the skin by most dermatologists and physicians operating in outpatient settings. Seborrheic keratoses are mostly benign tumors with distinguishing features that often describe them. There are morphological overlaps with other lesions found in malignant skin[1]. It is vital to consider differentiation features between malignant and benign skin tumors. As a result of the nature of benign Seborrheic keratosis, it is evident that these individuals have treatment. However, most of the patients still prefer undergoing treatment considering the preference given to the tumors [2]. Understanding the different treatment modalities and workups for managing Seborrheic keratosis is also vital.

It was believed that Seborrheic Keratosis would typically appear during the fourth and fifth decades [3]. Most individuals have five years to battle with Seborrheic Keratosis, while others simultaneously harbor the lesions in hundreds of numbers. The lesions are considered cosmetic distress and inconvenience to various patients. With time there have been treatment options for benign lesions, which mainly vary with the setting surrounding them [4]. Most healthcare institutions have come up with an explanation of the lesions' nature and have provided information, but no solution has been offered yet.

In different special settings, complicated methods may be utilized in treating the lesions, for example, plasma pen, carbon dioxide laser, and Alexandrite laser, among others [4]. Treatment could have been offered, for example, cautery, curettage, shaving, excisions, and cryosurgery with hydrogen peroxide. There is a probability of skin discoloration after the performance of cryosurgery in the darker types of skin. This is mainly dismissed given that it is a damage that is likely to occur after any exercise has taken place, with it being mainly utilized to remove lesions. It is crucial to note that the likely occurrence of risks is very minimal [4]. The Pathologic process

and etiology of the lesions partially embraced the lesions being put in place. Research shows that the lesions are considered a sign of too much exposure to ultraviolet rays and an aging sign [4].

Seborrheic Keratosis is mainly related to the proliferation of immature keratinocytes, which result in well-demarcated flat, shaped macules. The macules slowly grow and hence could also be oval or round. Over a certain period, the macules can magnify in thickness [4]. This causes them to resolve spontaneously in most layer cases. Research has indicated a higher expression of amyloid precursor plotting after APCR analysis was carried out quantitatively in real time through western blotting [4]. Also, the utilization of histo-chemistry techniques shows a higher expression of amyloid precursor protein than a normal Seborrheic keratosis adjacent to the skin in areas with high sunlight exposure. There are different varying features connected to benign lesions.

The attributes can be highly confused with other pigmented benign lesions and, at other times, be collated into malignant lesions such as squamous and basal cell carcinomas. Lesions are likely to be demented with melanomas if they are pigmented intensely. It is due to the periodic lack of distinguishing features excised with the verification of a diagnosis and to oblige with ruling out malignity [4]. Seborrheic keratosis presents itself in different colors: blue, black, dark brown, reddish pink, yellow, light brown, tan, and yellowish-orange [4].

Seborrheic Keratosis has been outlined classically to have an appearance that stuck on with a brown wax dropping [5]. There may be a regression of Seborrheic Keratosis on their own, making them crumbly and fall off in different bits, with patients giving a typical history in different cases. In most cases, the skin is likely to appear erythematous initially when there is the regression of Seborrheic Keratosis [5]. Seborrheic keratoses are likely to range in size, with a slight difference. However, they can be flat relative to the slightly raised papules, whereby rough surfaced papules are likely to become plagues surfaced by large papillomatous[4]. Seborrheic Keratosis is likely to occur in genital areas, legs and arms, with them not mostly seen on the soles

and palms. Seborrheic Keratosis is also commonly viewed on the chest and the back, uncommon on the scalp and face.

Dermoscopy

Dermoscopy is a non-invasive technique, mostly combining light microscopy and digital photography for diagnosing and observing Vivo skin pigments in the lesions. To carry out a dermoscopic analysis, there is a need to consider skin lesions that are mostly pigmented and covered with a liquid such as water, oil, and minerals [6]. The pigmented skin lesions are also examined under a specific magnification range, with some cases utilizing a digital imaging system identified as a dermatoscope [6]. To improve visualization of the sub-surface and the surface of obtained structures using the technique, the recognition of structures designed morphologically within the undetected lesions that, even at the end, cannot be detected unless otherwise [6]. The morphological structures viewed in dermoscopy can mainly be classified based on different goal features that allow a different preliminary categorization of the various skin lesions that are predominantly pigmented with other local features that represent the alphabets in dermoscopy.

The global features that are mostly in existence allow the broad classifications of different skin lesions with different global features existing in melanocytic lesions that were definable.

It is crucial to note that Seborrheic Keratosis can, at times, imitate malignant and benign skin tumors. It makes a biopsy necessary for patients that cannot be distinguished from usual skin malignancies [7].

The diagnosis made clinically consists of a dermatoscopic examination in different cases. Various tests about the previous studies highlight the variability of dermoscopy in seborrheic Keratosis [7]. However, most exercised seborrheic Keratosis can be classified into up to ten dermoscopic patterns repetitively. Dermoscopy of classic seborrheic Keratosis shows different milia-like cysts with sharply demarcated borders.

In most cases, dermoscopy permits a prompt diagnosis that is liable in most cases by making a revelation of the Seborrheic keratosis typical pattern. This is identifiable as milia-like

cysts' presence with comedo-like openings, light brown fingerprints, and fingerprint-like or brain-like appearance structures mostly light brown [8]. In a case of an unclear feature in dermoscopy, no accurate diagnosis is permitted, thus making the histopathological examinations retain the position of being the best opinion.

In most cases, the skin appears to be eventually undistinguished, especially when there is a regression of Seborrheic Keratosis, which can show some findings dermatoscopically in a typical way with a grey brownish, bluish or whitish coarse granule. There are different features dematoscopically that are described in connection to classic Seborrheic keratosis. They include:

1. Milia, clods, and white dots that look like cysts
2. Network-like structures
3. Fat fingers or curved lines
4. Comedo openings or colored dissimilar clods
5. Hairpin or looped vessels
6. Moth-eaten borders or scalloped margin
7. Sharp demarcation

● **Milia, clods, and white dots that look like cysts**-In dermatology, they are viewed as small rounded structures with white to yellowish light colors that are mostly found scattered within. At times they can be found peripherally located at one or more ends of the lesion [5]. They are, however, not unique concerning Seborrheic keratosis and can be viewed in melanomas, and nevi. In the history of pathology, they are viewed as intra-epidermal globules, commonly identified as cysts in pseudo-horn.

However, the resumes' features can vary in size even within the lesion. There may be the presence of different sizes of Milia, which are best visualized using the highly non-polarized dermoscop[5].

● **Network-like structures**- Network-like structures refer to lesions, although they are not actual network pigments as viewed in melanocytic nevi; hence the term is regarded as one that was coined [5]. Compared to the counterpart pigments, the network grid is larger, with the network lines

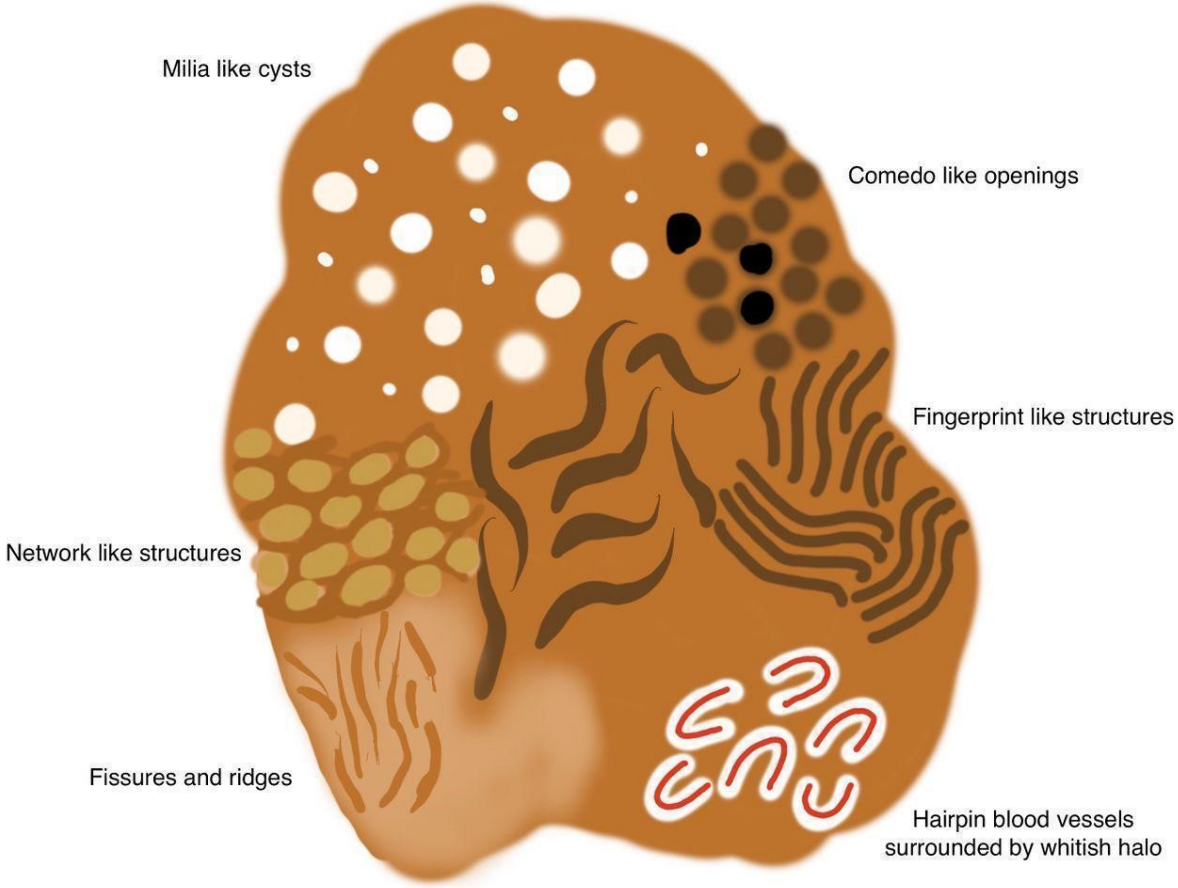
being hyper-bistered while, in the end, they are immediate at the periphery [9]. The existing holes in the network-like structures are not related to the dermal papillae tip with keratin systems that are filled on cytological segments.

● **Fat fingers or curved lines**-Fat fingers form a vital part of Seborrheic Keratosis. They are also likely to vary in length and size appearing to be thick or thin [9]. Fat fingers develop in pairs usually, whereas they can be aligned or be apparent randomly throughout the existing lesion. The thickness cytologically has curved lines, which vary with the degree of acanthosis and increase with its development, as viewed in the lesion [9].

● **Comedo openings or colored dissimilar clods**-They are identified as invaginations filled with keratin. The existing clods are mainly colored and are made using keratin plugs. The uncommon features in Seborrheic Keratosis may sometimes be in the nevi dermal [9]. Conventionally, the keratin plugs correspond to the open cyst pseudo horns that are mainly on the surface of the existing epidermis. They come in different shades, such as black, blue, and brown, mainly due to an admixture of white and yellow keratin composed of varying melanin quantities. The introversions in a Seborrheic keratosis are identified as clods of different sizes and forms [9].

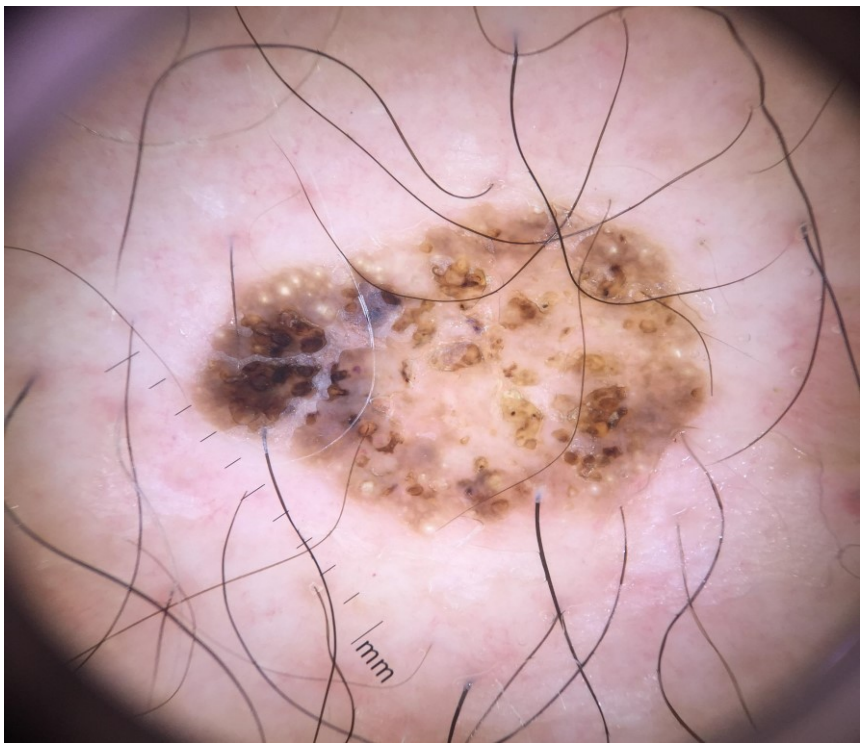
● **Hairpin or looped vessels**-There is a mixed vessel displayed by Seborrheic Keratosis, but the most typical pattern they possess is mainly looped [10]. Also, a marking of a dotted vessel is visible in the lesions present. The vessels contain a whitish halo highly comparable to the keratin that is mainly adjacent to the vessels.

● **Moth-eaten borders or scalloped margins** - These are Seborrheic Keratosis that is flat with a sharp demarcation with existing crenated borders, which initially were identified as borders that are moth-patterns [10]. **Sharp demarcation**-They include Seborrheic Keratosis, which is flat with demarcation that consists of scalloped margins, which assist with the differentiation of them in dermatoscopy from melanocytic lesions [10]. Most of the Seborrheic keratosis that is thicker is frequently present together with the lesions that are demarcated.

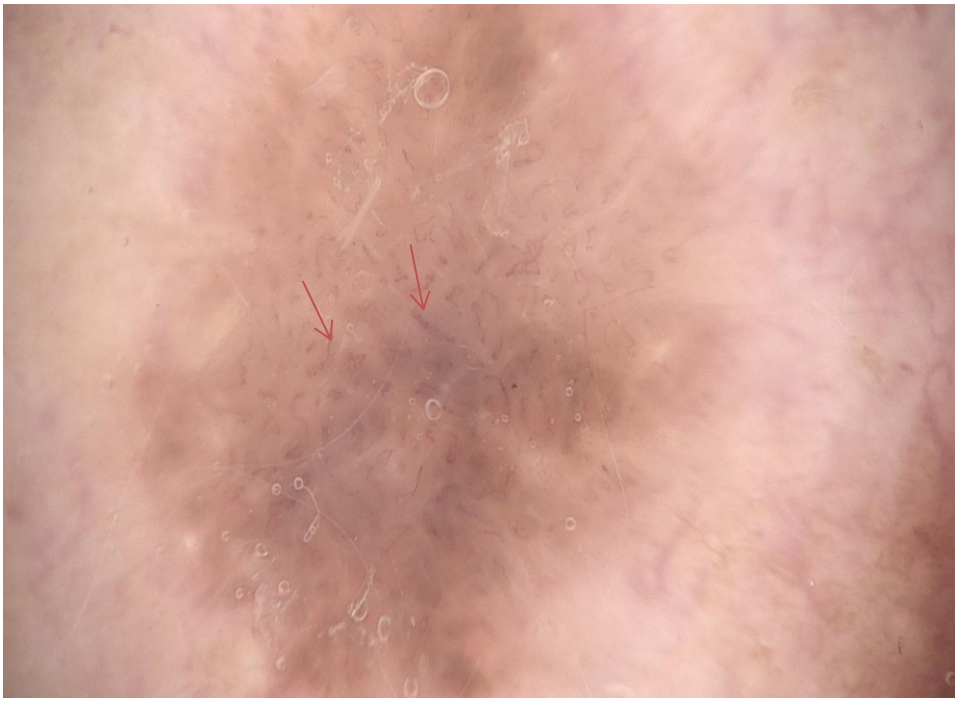


- Seborrheic keratosis Schematic. Ralph P.Braun. Dermoscopedia

The following pictures shows some features of SKs under dermoscopy :



Pic 1: Milia-like cyst of SK lesion in skin type 3.



Pic 2: Hairpin or looped vessels of SK lesion on skin type 2.

Pic 3: SK in skin type 6 shows fissures and ridges under dermoscopy

Different subtypes have been divided from Seborrheic Keratosis In reference to histology variations. They include:

1. Clonal
2. Reticulated
3. Acanthotic
4. Irritated
5. Hyperkeratotic
6. Melano-acnathoma
7. LPLK or regressing type

- **Clonal**-It is not an ordinary alternative, but it can be similar to malignant and benign lesions, for example, melanoma. In a study, there was an observation of clonal Seborrheic keratosis whereby dermatoscopy showed cysts resembling milia and a sharp demarcation [3]. However, some of the existing features showed a similar pattern to that of a large globular to what is viewed in melanocytic lesions [11]. In consideration, smaller globular

bluish structures have a deeper pigmentation at their center, which were viewed as irregularly disrupted within the normal lesion described in the basal cell context of carcinomas [11]. However, cytologically they mostly display a well-demarcated basaloid intraepithelial nest which may also consist of large pale cells within Seborrheic Keratosis that is acanthotic. There is more description of well-defined nests looking within the corresponding epidermis.

- **Reticulated-**The type of Seborrheic Keratosis is best viewed on an individual's face, but that does not mean that it is limited not to be seen on the body too. The type of Seborrheic Keratosis portrays a reticulated pattern with a pseudo-pattern network. The type of pattern is mainly displayed in Seborrheic Keratosis, that is, fat or most cases, and when it can be noted on the face, it has a typical round opening that is white at the end of its pores [11]. In most cases, it is linked to lentigo maligna or nevus, which are demarcated with scalloped margins that assist in diagnosing a benign lesion. The type of Seborrheic Keratosis is most common when a person's skin is exposed to sunshine compared to the skin that is not exposed to sunshine. Numerous thin tracts are portrayed in histopathological pictures related to basaloid epidermal cells that are interwoven and branched to the tracts [11]. There is less thickening of the epidermis and cysts pseudo horn, which are less often seen. In most cases, the observation of hyperpigmentation that can be viewed with some senile lentigines features can also be observed.
- **Acanthotic**- It is a type of Seborrheic Keratosis that is most common in human skin. The type of Seborrheic Keratosis appears in a teardrop, oval and round shape with a veracious rough surface with them being demarcated fairly. In the dermatoscopy of Seborrheic Keratosis, there are various sizes of round white cloth clods with invaginations of keratin [12]. The colored clods that appear have different sizes and shapes that are variant and looped on readily visible vessels. The features histologically are in correlation with the basal cells that contain a thick layer with cysts possessing a pseudo horn [12]. The pseudo

horn on the cysts has an opening on its surface with a correspondence of the epidermis to the clods that are colored with different sizes and shapes.

- **Irritated**- Clinicians show that the lesion's surface can be scaly and clasted. Irritated Seborrheic keratosis can present a lesion eroded with blood spots in multiple places similar to those visible in most growing warts. Seborrheic Keratosis is not very subsequent, with it being clinically confused with other epidermal tumors in dermatology. In most cases, conventionally, confirmation is regarded as necessary to rule out benignancy, in most specific squamous carcinoma cells [12]. Irritated Seborrheic keratosis dermoscopy does not indicate typical characteristics, for example, milia-like cysts with comedo openings and typical features that are likely to mimic a squamous cell carcinoma [3]. Irritated Seborrheic keratosis cytologically shows flattened epithelial cells, which are flaking cell carcinoma eddies-eosinophilic flattened cells. There is a lack of typical kind of findings in studies, but there are observations that have been made. As observed, the irritated Seborrheic keratosis has round pink structures that lie on a white background and are highly likely to correspond to dilated blood vessels around acanthotic tumor cells in histopathology [12]. The dermatoscopic picture is felt in the tumor cells making it more specific to irritated Seborrheic keratosis. The epithelial cells are organized in a manner that resembles an onion pill. The irritable Seborrheic keratosis shows downward proliferation areas for the squamous cells that break gently through a horizontal line [13]. This makes it generally present in non-irritated normal Seborrheic keratosis. Most of the irritated Seborrheic keratosis in the histological findings are a characteristic of squamous eddies. There was the existence of other groups that worked with determining dermoscopic criteria accuracy between squamous cell carcinoma and Seborrheic keratosis. There are round structures with a pink color on a white background was a term used to describe white halos that are mostly found within the blood vessels even with the existence of other findings [14]. The findings are elaborated, explaining that most irritable

Seborrheic keratosis diffuses and scales with irregular vessels along the periphery. The significant scale contains more potent predictors of squamous cell carcinoma.

- **Hyperkeratotic**- Hyperkeratotic Seborrheic keratosis is more common in individuals who are less exposed to the sun than those exposed to the sun [15]. Dermatoscopic concepts are not particular, showing a yellow or whitish thick irregular scale. Different characteristics display hyperkeratotic Seborrheic keratosis as a rough, scaly surface that is demarcated. It has no rounded clods with a whitish substance or colors dissimilar to the clods. There is an emphasis that dermoscopy should ideally be on the lesion part with the application of minimal hyperkeratosis. This is to assist with identifying ridges and fissile, which are a reflection of epidermal change, specifically in the papillomatous [16]. Horn cysts that are recognizable consist of obsolete keratinization with a granular layer on its surrounding that is often thin, making them part of a report in the category of the subtype Hyperkeratotic Seborrheic keratosis in histology show proof of prominent papillomatosis and hyperkeratosis [16]. They are also viewed as squamous cells possessing scattered epidermal basaloid cells. Hyperkeratotic Seborrheic keratosis also indicates findings containing cytopathological evidence of huge acanthosis but with mild and missing papillomatosis and hyperkeratosis. They also contain horny invaginations, which are several on different cross sections that appear as pseudo-horn cysts
- **Melano-acanthoma-** This is a type of Seborrheic Keratosis that is pigmented more deeply and, simultaneously, gives a suggestion that can be highly confused with melanoma. Melano-acanthoma, as shown in some studies, cannot be regarded as frequent with the indications in place in some literature. The existence of heavy pigmentation in most cases makes a diagnosis with the assistance of a difficult dermoscopy [16]. This is because it is likely to mask Seborrheic keratosis typical features, thus requiring a definitive diagnosis in the difficult dermoscopy present in the definitive diagnosis. There has been a typicalness of melano-acnathoma dermoscopy calling for students to carry out

melano-anathoma series of evaluation [16]. From the evaluation, there is evidence that the melano-acnathoma contains a set of Seborrheic keratosis features that can be distinguished, with the most common one having a prevalence degree because of the sharp demarcation, comedo opening, and the presence of two or more cysts that look like milia.

In most cases, the fissures or ridges are not very common, together with hairpin vessels containing the scalloped margins. The melanoma features in the melano-acnathoma series include typical dots, polymorphous vessels, granularity, and a blue-white veil. In the existing series, only a few Seborrheic keratoses are heavily pigmented, contrasting with the literature document describing heavy pigmentation in general [17]. Analytically the melano acanthomas portray numerous large melanocytes that are dendritic within an acanthotic epidermis. There were reports of findings in collaboration with various previous studies concerning melano-acnathoma cytology analysis. The findings include dendritic melanocytes, acanthosis, hyperkeratosis, and hyperplastic epidermis. The performance of immune histochemistry testing confirmed that melanocyte escalated density, and that of Langerhans cells was confirmed [17]. Melano-acanthoma is described to be among the different types of Seborrheic Keratosis, given that it gives a presentation of it being an intra-oral lesion. The existing lesions are asymptomatic with common intra-oral sites with palategums, lips, and buccal mucosa. They are said to continue regressing when an irritating trigger is removed, even with them being reported to be more commonly visible in younger and black patients.

- **Lichen Planus Like Keratosis (LPLK) or regressing type**- Lichen Planus Like Keratosis can also be related to benign lichenoid Keratosis. They are an entity of benign skin that is considered part of a phase in regression in connection to benign skin lesions, including Seborrheic Keratosis or solar lentigo [17]. However, in other cases, it can be considered a phase of regression of a malignant tumor type, such as lentigo maligna [19]. In the 1970s, reports indicated lentigo senilis transformation histologically into lichen

planus-like Keratosis in different specimens. The description given to lentigo senilis was highly described as possessing cytological features with basaloid cells that highly profiliate, causing them to accumulate melanin pigments. After the accumulation, there is a downward budding that does not have a melanocyte proliferation that is highly significant being visible[19]. When gathering the information, there was a conclusion that the continued expansion of basaloid that have elongating buds making cod branching and intersection septae be produced in a histological pattern [19]. This contains a well-reticulated Seborrheic keratosis, and the diagnosis is perceived as showing the keratin cysts' presence, thus making the diagnosis become sounder.

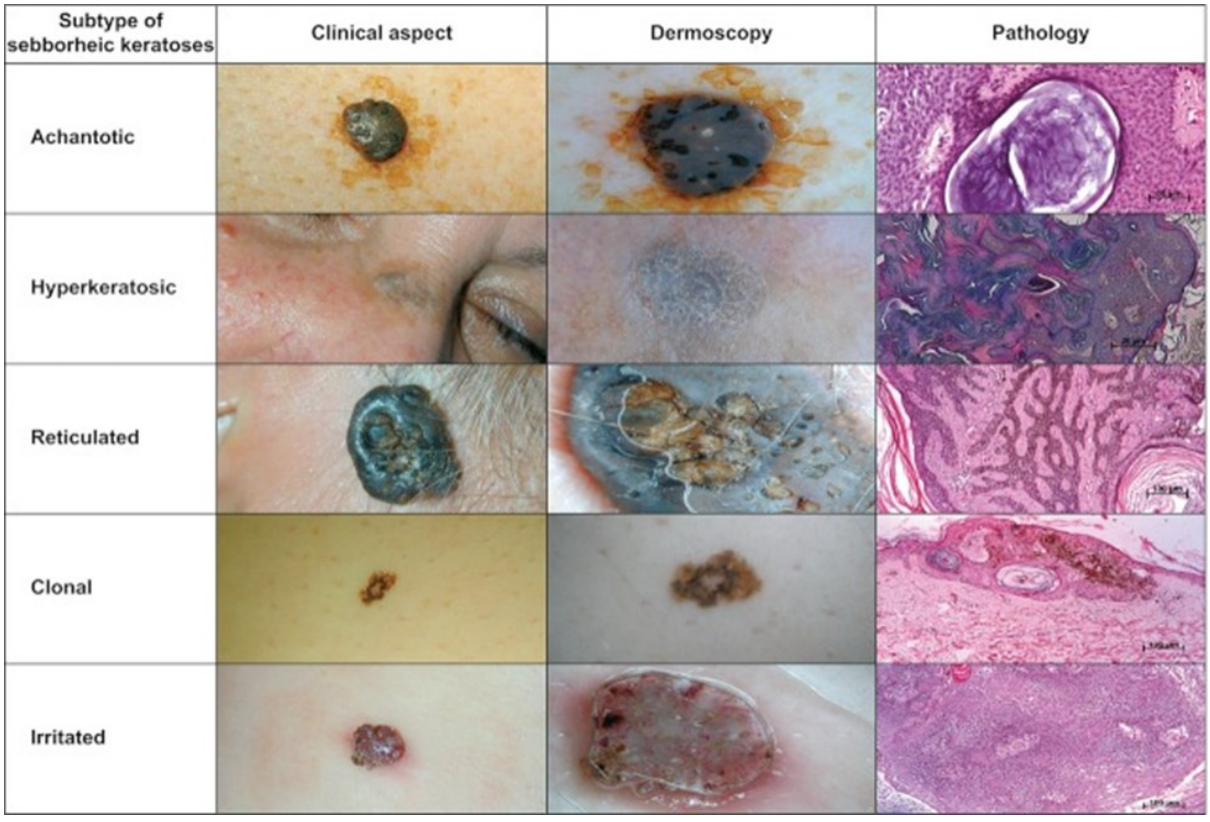
A clinical pathological evaluation has also been conducted to clarify the large case numbers with LPLK. The cases evaluated have a high percentage indicating fewer people possess an adjacent skin. In comparison, a higher percentage shows the presence of a lesion in the same number of cases [19]. From the studies, Lentigo solar can be indicated as an adjacent lesion skin in most cases, and it can be reticulated in cases of Seborrheic Keratosis [20]. This causes findings reinforcements as indicated initially with Seborrheic Keratosis indicating blue and brown grey coarse granules in a diffuse and localized pattern.

The findings under observation find evidence that assisted them in making reports that showed similar histologic and dermatoscopic colored granules. They are also consistent with patterns of distribution that exist in lentigines of regressing solar, supporting the existing literature that gives a wider explanation of benign lichenoid Keratosis and Lichen Planus Like Keratosis [20]. This has a regressive response of a skin tumor that might be preexisting. There is the provision of an explanation of why there is a contrast between the grey-blue granules in the regressive phase of a malignant appearance of a tumor to make multifocal and finer Lichen Planus Like Keratosis. Other studies referred to Lichen Planus, Like Keratosis, as an evolving chronology [20]. This is because of the reiterated

observations in previous studies showing Lichen Planus Like Keratosis to be at the middle and even the late stages, causing them to lose the characteristic obtained from the dermoscopy findings.

The findings may also indicate globules or irregular dots, rhomboid structures with streaks suggesting a phase of regression that possesses a malignant tumor instead of a benign skin lesion [20]. Reports also show granular patterns that are localized in the Lichen Planus, Like Keratosis in early stages, which are mainly consistent with regressive changes initially and make a diffusion of regression granular

patterns to transform and become the most and usually experienced



Common types of seborrheic Keratosis with different aspects held clinically, pathology, and dermoscopic

Differences between Seborrheic Keratosis and Actinic Keratosis

The differences between the two diseases can easily be noted when carrying out a self-screening to help understand better the main difference that exists between particular skin lesions. However, the two kinds of diseases possess similarities, but it is vital to understand what the two types of keratosis hold. The exposition of the skin mainly causes actinic Keratosis to direct sunlight, causing crusty and scaly growths [21]. Actinic Keratosis is primarily found on skin areas that have a higher exposure to sunlight for a long time, which include the neck, lips, ears, hands, and shoulders. However, it is vital to note that actinic Keratosis can be cancerous to the skin, given that skin cancer is characterized by squamous cell carcinoma and basal cell carcinoma. Actinic Keratosis develops further to become squamous cell carcinoma.

Actinic Keratosis mainly affects individuals who have fair skin and are over forty years with it being most common in men. Individuals with outdoor occupations who live in climates with many suns experience frequent sunburns and are more exposed to actinic Keratosis. Individuals who have previously used tanning beds are also exposed to the risk of getting actinic Keratosis [21]. However, the cause of Seborrheic Keratosis is not well known, with most affected individuals having a history of the condition. Seborrheic Keratosis, unlike actinic Keratosis, is not linked to any skin cancer type but has been linked to other cancers affecting other body parts.

Treatment options that can be adopted to treat both types of Keratosis

Identifying whether a patient's skin lesions are Seborrheic Keratosis or actinic is crucial, given that the treatment options applied can differ. A dermatologist will likely offer different treatment options based on the lesion's location and size. The possibilities include outpatient surgery, topical therapies, medication, and Cryotherapy. The utilization of oral retinoid is commonly embraced with the treatment of actinic Keratosis, given that it appears in different body parts [22]. It can be noted that topical creams utilized for the lesions appearing in many body parts are: tretinoin, five-fluorouracil cream, and ingenol mebutate gel, among others. Topical and

medication therapies can highly assist with clearing large skin areas while reducing infection and scaling.

Cryotherapy is utilized to freeze already damaged cells by using nitrogen liquid to destroy and remove the cells. The treatment is recommendable for medium and small-sized lesions, given that they have minimal risks. Some risks include a change in the skin tone, scars, and blistering. Some outpatient surgical options can also be utilized, mostly electrocautery and curettage [22]. Curettage is a process that causes layers of skin cells to be scrapped away to minimize scaling risks.

In most cases, dermatologists do not recommend Seborrheic keratosis treatment, but many individuals opt to have **S**eborrheic Keratosis removed. The instances in which they are removed include if they catch on jewelry, clothes, or other cosmetic reasons. Seborrheic Keratosis is removed using topical treatments, laser ablation, electrocautery, curettage, and cryosurgery [22]. If laser ablation is applied, their lasers are used to destroy the lesions. On the other hand, topical treatments are utilized to assist with dissolving the skin cells that are already affected. Skin lesions can be prevented even though Seborrheic Keratosis cannot be stopped. Individuals should minimize their sunshine exposure time, whether artificial or natural, to reduce the possibility of developing actinic Keratosis [23]. When an individual is spending some time outside, it is recommended that they apply sunscreen in all areas of their skin that are highly exposed to direct sunlight, not excluding their lips.

Sunscreen is recommended to be reapplied after every two hours. It is also crucial for individuals to wear protective clothing when they are out in the sun, such as long sleeves, sunglasses, and hats, to decrease their risk of developing actinic and Seborrheic Keratosis. A month of home cancer screening should be connected with an annual skin cancer screening with the dermatologist [23]. This is highly likely to assist with identifying actinic Keratosis and Seborrheic Keratosis, as well as any skin lesion that may appear suddenly. Having a regular screening can also make it easier the identification of any other skin lesions that can cause a

change in size, color, and shape. Also, possible precancerous growths can be identified early, creating high chances of positive treatment outcomes. Suppose a patient is unsure of any new skin growth happening in any area of their skin or observes other skin changes. In that case, they need to schedule an appointment with a dermatologist in order for them to have an examination conducted.

Patients and Methods

The observational study was conducted on 125 seborrheic Keratosis patients in a dermatology outpatient clinic. The lesions included were examined clinically and by dermoscopy. The lesions were then analyzed and well documented according to the noted patterns [6]. All dermoscopic images included in the study were of patients who had signed a written consent form for images to be taken. No specific allocation of funds and resources was undertaken for this study by any institution or company [6]. This was a retrospective study based on dermoscopic images, for which the Ethics committee obtained a waiver. Any expenses incurred were undertaken by the investigator during the study.

The images were taken in an outpatient clinic setting of Rumailah Hospital (Qatar) patients and Graz Hospital (Austria). The image selection was based on seborrheic Keratosis, in which dermoscopic images of patients were taken into account, which was taken in a retrospective period of 20 months.

Patients

The observational study was conducted on 125 seborrheic Keratosis patients.

Some patients have more than one lesion on the skin that was included with our study.

200 seborrheic keratoses were collected in total, which:

50 lesions of skin type 1 and 2, 50 lesions from skin type 3, 50 lesions from skin type 4, and 50 lesions from skin types 5 and 6

Participants were chosen from the outpatient dermatology clinics at Rumaliah Hospital and Graz Hospital From 2001 to 2022

All patients underwent brief dermatological and dermoscopic examinations.

Inclusion criteria:

1. Patients of both genders.

2. Patients of more than 18 years.

3. Patients with seborrheic Keratosis

4. Patients with all skin type

We use a polarized and non-polarized technique with special media (ethanol or ultrasound gel) to examine each seborrheic keratosis lesion that allows visualization of deep skin structures. Patient code was used to collect the photos and analyzed by PI. Lesions were categorized by pattern and recorded in a table.

Materials

Images included in this study were taken by two different cameras and dermatoscopes. The equipment used was:

1. A Dermlite dermoscopy (DL4N, USA), with a 25 mm lens system, 28 hi, cross-polarized and non-polarized illumination. Using a digital dermoscopic system by attaching the dermoscopy to a compatible iPhone 12 Pro Max.

2. A Dermascan Derma genius, Heini Delta 20T.

Statistical Methods

The data collected from patients were correctly coded and analyzed using the software IBM SPSS 26 (statistic package for social science).

Study Design

After image selection, patients were classified according to their age, sex,skin type and the location of the seborrheic keratosis, from where the image was taken. Specific dermoscopic reporting criteria were also utilized.

Design implemented in the study

After image selection, the study format had a simple outline, categorizing patients according to their sex, the location of the seborrheic keratosis, and the skin type from where the image was obtained. A particular dermoscopic reporting criterion was also put in place [6]. An additional consideration was the histopathology results; if any patient had a biopsy for the validation of histopathology, results that were also recorded that had been made.

Criteria of Exclusion

1.Dermoscopic images of patients with a history not specifying the site of the lesion on the body were also excluded [24].

2. Suspicious dermoscopic images of patients with a provisional diagnosis of seborrheic Keratosis, which thereafter were not histologically verified, were also excluded [25].

3. The principal investigator PI examined all the patients whose images were put in place. The principal investigator took the images[25].

4. Dermoscopic images of patients with a history not specifying skin type were excluded [26].

5. The inclusive images in this study were taken with two different dermatoscopes and cameras [26].

Criteria of Inclusion:

1. Both male and female patients' images were considered [26].

2. Images used for seborrheic Keratosis were selected only [27].

3. The clinical and dermoscopic diagnosis performed by an experienced clinician [27].

4. Dermoscopic images with a provisional diagnosis of seborrheic Keratosis, which were verified afterward histologically, were put in place [27].

5. The skin type documentation in patient history, a questionnaire used [18].

6. Patients had no age limitation when selecting the images [18].

7. The documentation of the location of the skin lesion [18].

8. The dermoscopy device was used to perform the dermoscopic examinations of all the seborrheic keratosis patients.

Reporting Criteria

The criteria put in place the following reporting criteria for the dermoscopic features seen in the seborrheic Keratosis.

1. **Skin Type (number of patients)**

Skin type 1	Skin type 2	Skin type 3	Skin type 4	Skin type 5	Skin type 6
5	28	31	21	31	9

2. **Pigment Amount**

Heavily Pigmented	Intermediate pigmented	Lightly Pigmented
47	80	73

3. **Color**

Light brown	**Dark Brown**	**Black**	**Blue**	**Yellow**	**White**	**Red**
59	41	24	15	35	17	9

4. **Local Features**

Milia-Like Cysts	**Comedo Like Openings**	**Fat fingers**	**Network-Like Pattern**	**Sharp Border**	**Hairpin Blood vessels**
59	97	29	41	144	29

fissures & Ridges.	**cerebriform Pattern**	**flat**	**raised**	**Moth eaten border**
95	**69**	**42**	**158**	**23**

5. **Lesion Size**

Small size < 6mm or equal	Medium size 6-10mm	Large size >10mm or equal
18	125	57

Histopathology:

In 125 patients, the seborrheic Keratosis observed on the original consultation with no standard features was excised for confirmation histopathologically of diagnosis and to rule out malignancy or dysplasia. Out of 200 seborrheic keratosis, 20 were excised to confirm the diagnosis.

Results

The statistical analysis done was as follows:

1. **Skin Types (patients number)**

All 6 Fitzpatrick skin types (ST) were included in the study; the patient numbers were: Skin Type 1 -5, Skin Type 2-28, Skin Type 3-31, Skin Type 4-21, Skin Type 5-31, and Skin Type 6-9. *Fig. 1.*

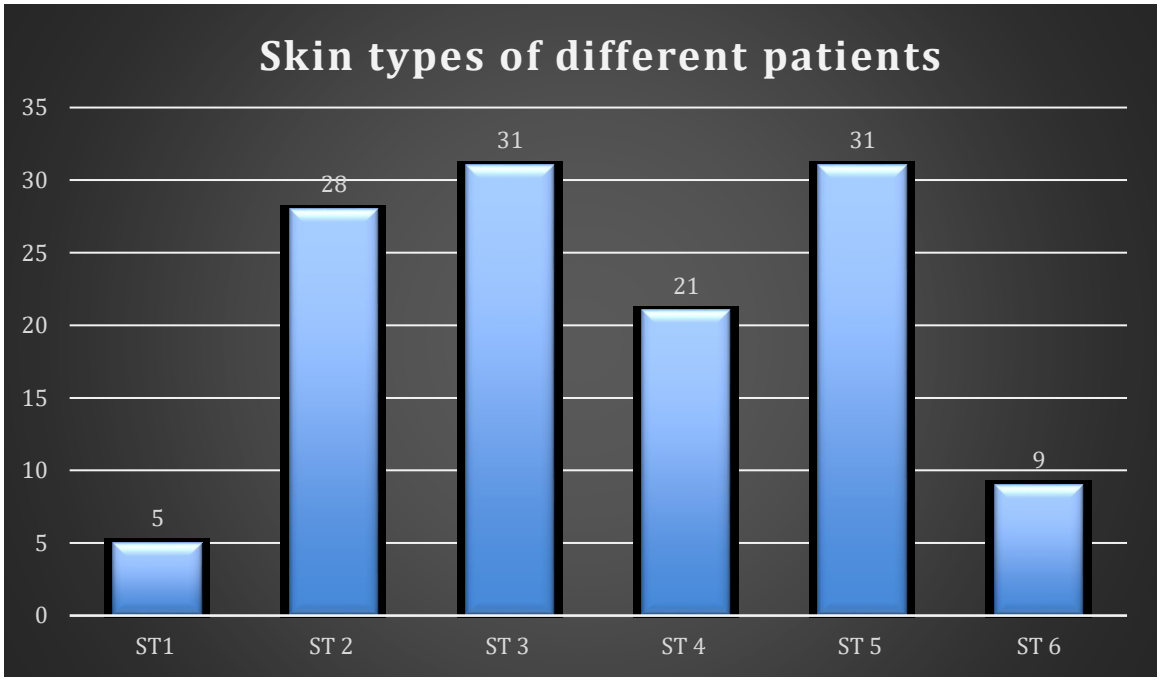


Fig 1. Skin types of different patients

2. Age

The patient's ages ranged between 24– 89 years. *Fig 2.*

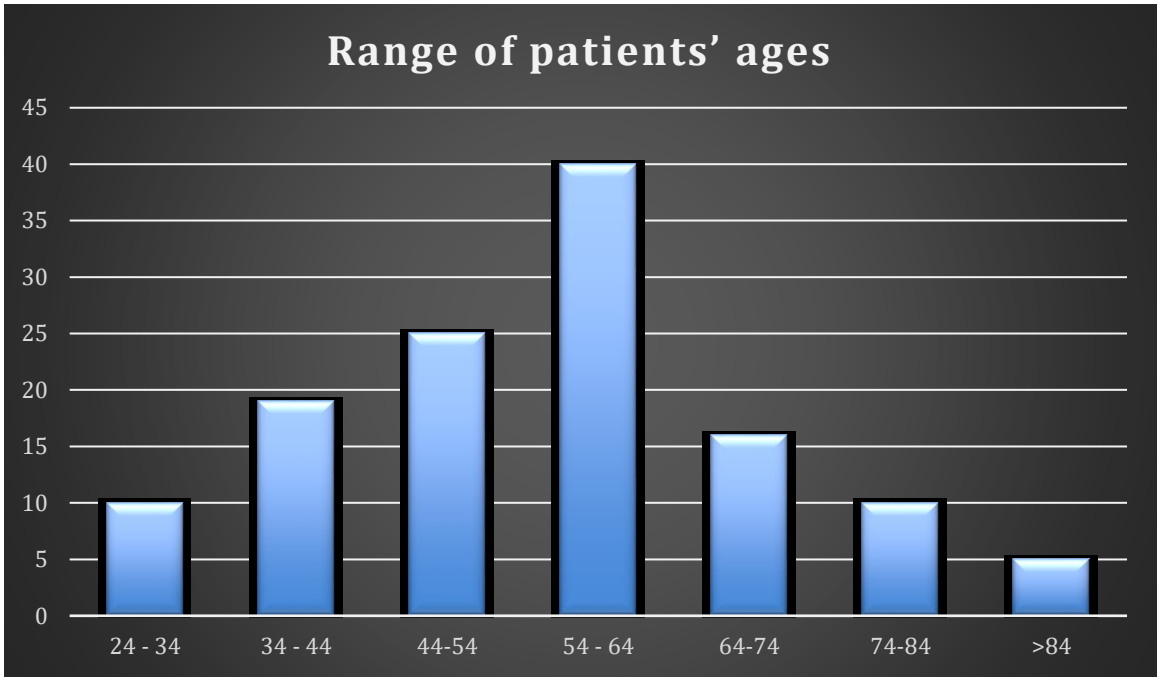


Fig 2. Range of patients' ages

3. Patient Gender

The dermoscopic images were from 67 males and 58 females. *Fig 3.*

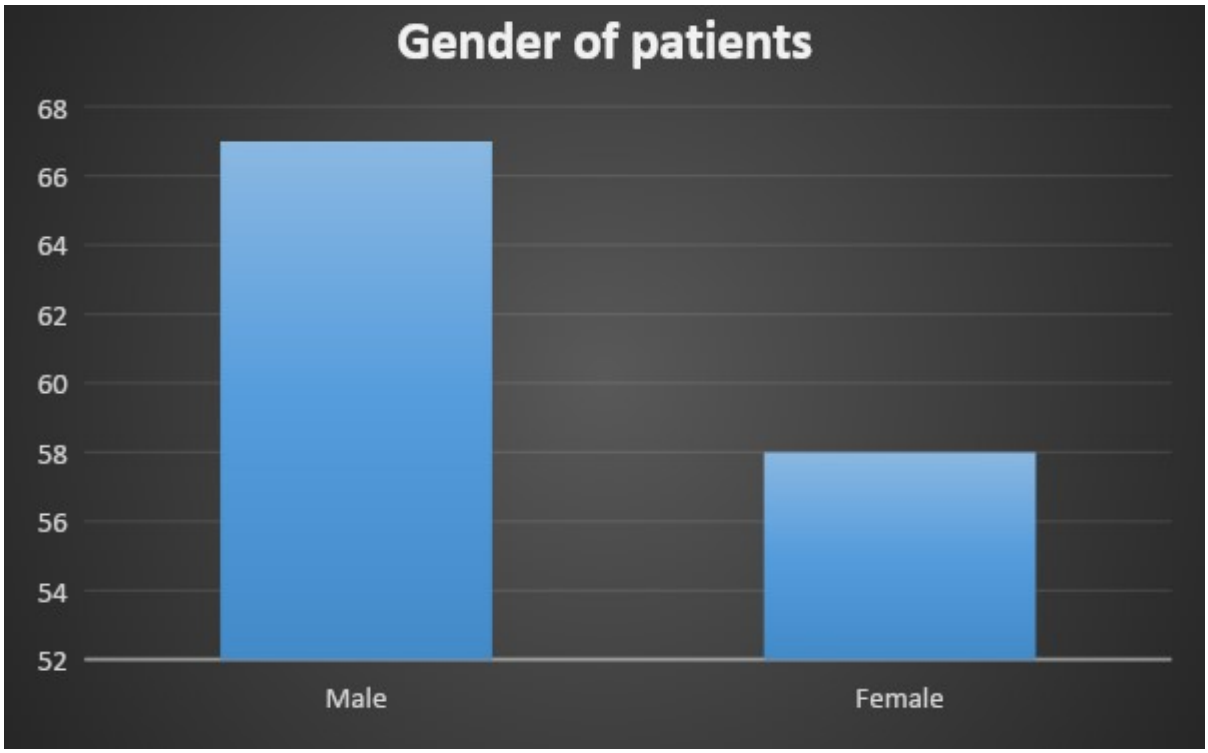


Fig 3 Gender of patients

4. Lesion Distribution in the different Skin Types (position of the Seborrheic Keratosis on the Human Body)

200 images of seborrheic Keratosis were taken; from these, 14 Seborrheic Keratosis were on the scalp, 38 on the face, 4 on the neck, 24 on the chest, 60 on the back, 8 on the arms, 7 on the shoulder, 6 on the thighs, 10 on the abdomen, 11 on the legs, 12 on the hand, 3 were situated on the feet, and 3 in the inguinal area. *Fig 4*

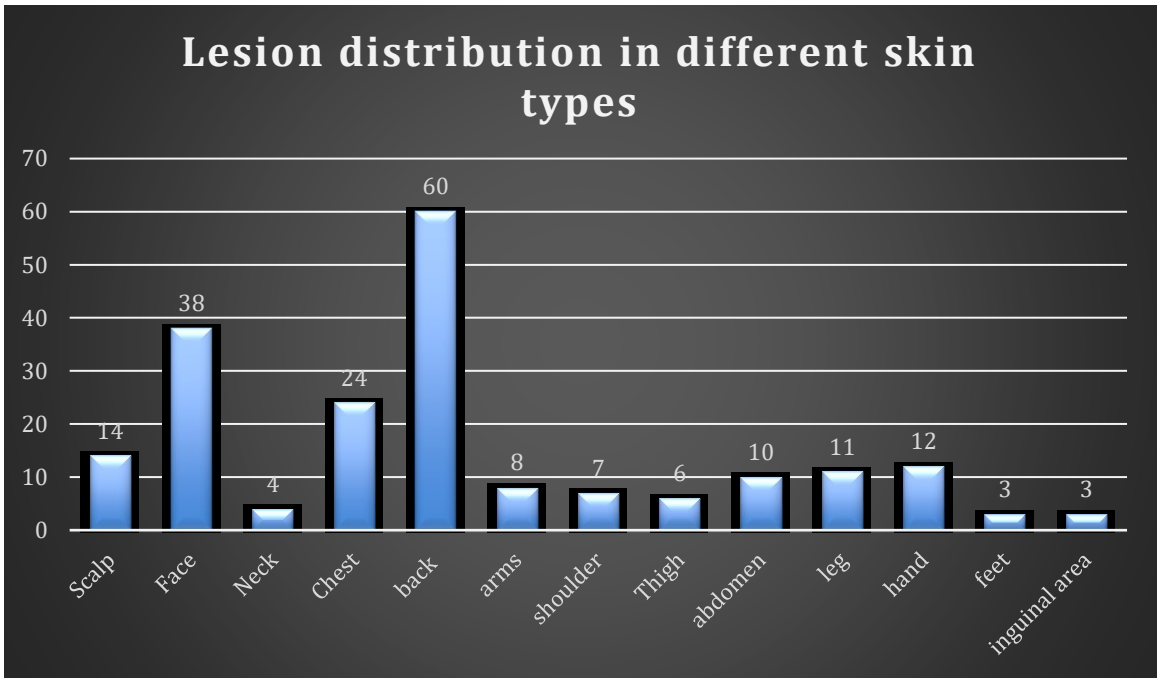


fig4. Lesion distribution in different skin types

5. Distribution of Lesions Based on Skin Type

- In patients with Skin Type 1, 2 SK were on the scalp, 2 on the face, 4 on the chest, 2 on the abdomen and 2 on the back.

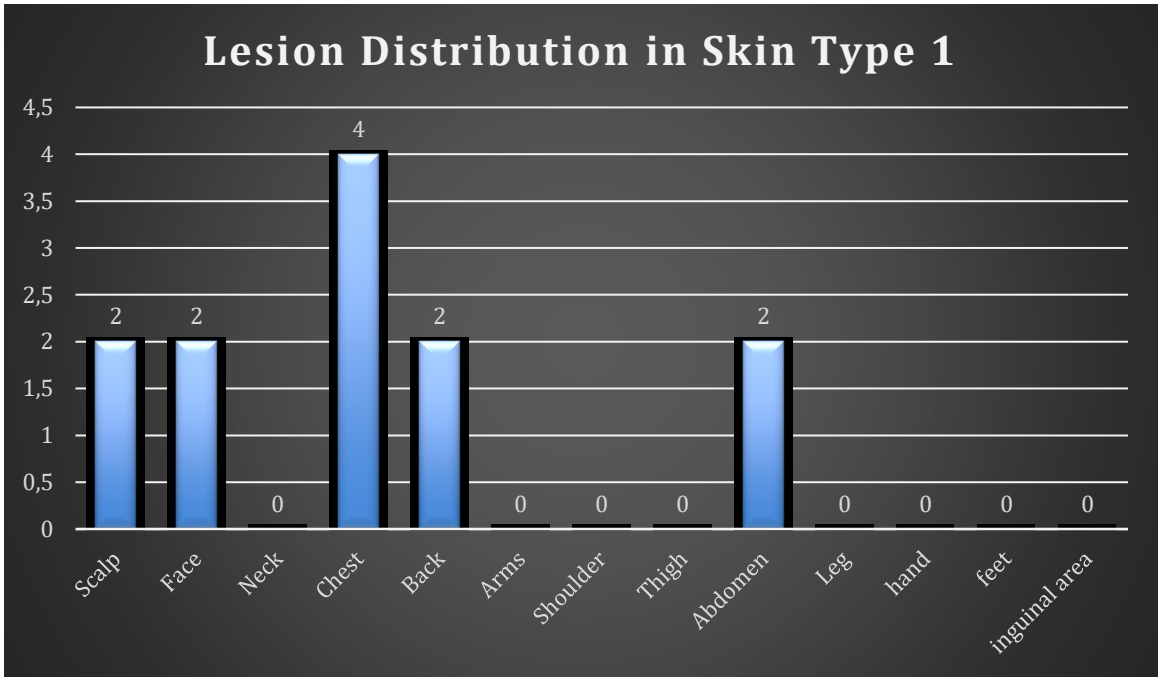


Fig 5. Lesion Distribution in Skin Type 1

- ST 2 patients had 2 seborrheic keratoses on the scalp, 6 on the face, 2 on the neck, 1 on the shoulder, 4 on the chest, 4 on the abdomen, 13 on the back, 3 on the legs, 2 on the arms and 1 on the hand. *Fig 6*

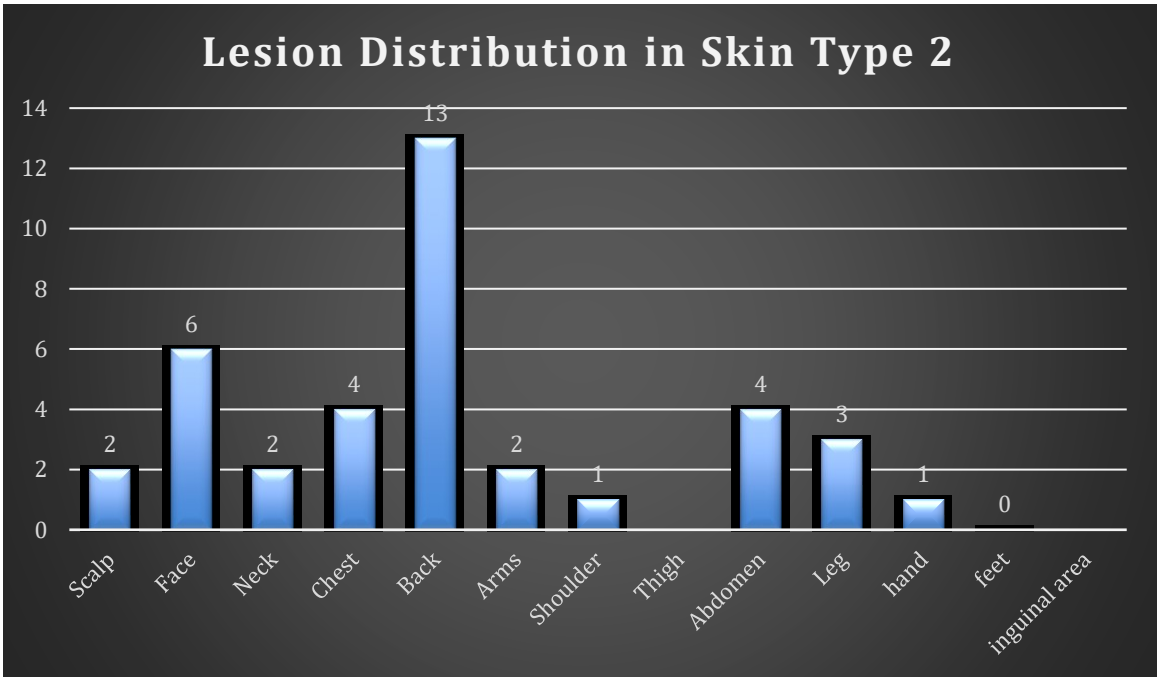


Fig 6. Lesion Distribution in Skin Type 2

- In ST 3 patients, there was 2 seborrheic keratosis on the scalp, 6 were on the face, 1 on the shoulder, 9 on the chest, 3 on the abdomen, 18 on the back, 2 on the thighs, 2 on the legs, 3 on the arms, 2 on the hand, and 2 were on the feet. *Fig 7*

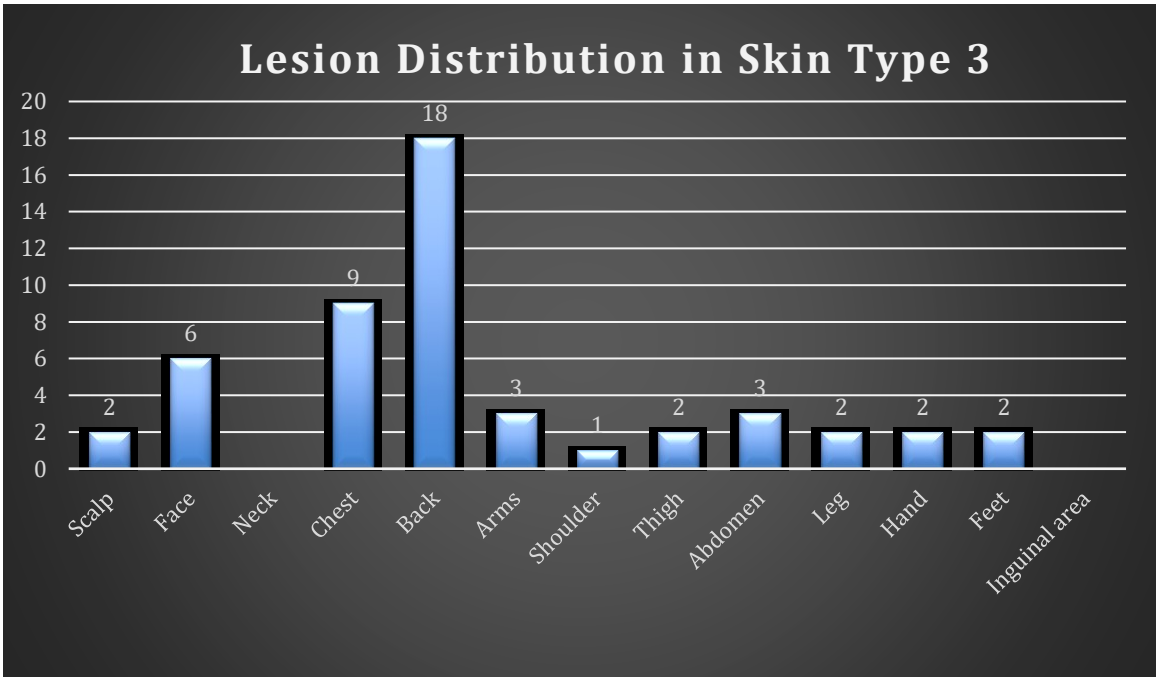


Fig 7. Lesion Distribution in Skin Type 3

- In patients with Skin type 4, 1 seborrheic keratosis was on the scalp, 13 on the face, 3 on the shoulder, 5 on the chest, 1 on the abdomen, 15 on the back, 1 on the inguinal area, 3 on the thigh, 3 on the legs, 2 on the arms, and 3 on the hand. *Fig 8*

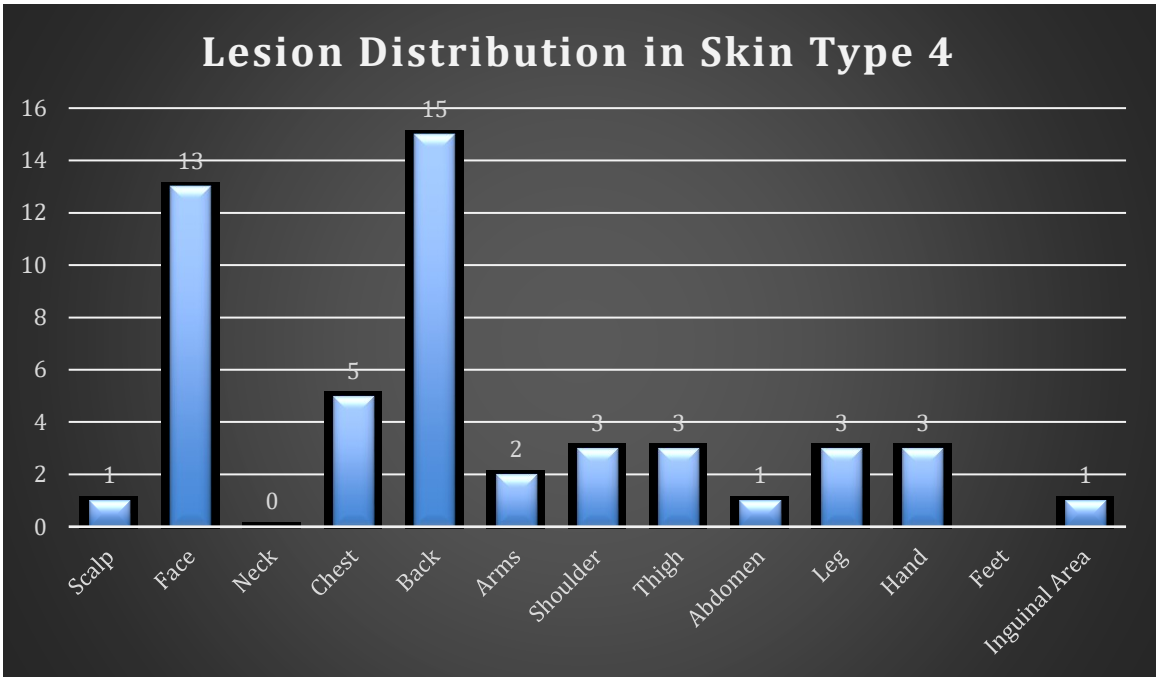


Fig 8. Lesion Distribution in Skin Type 4

- ST 5 patients had 4 seborrheic keratoses on the scalp, 5 on the face, 1 on the neck, 1 on the shoulder, 1 on the chest, 11 on the back, 2 on the inguinal area, 1 on the thigh, 2 on the legs, 1 on the arm, 3 on the hand, and 1 were on the feet. *Fig 9*

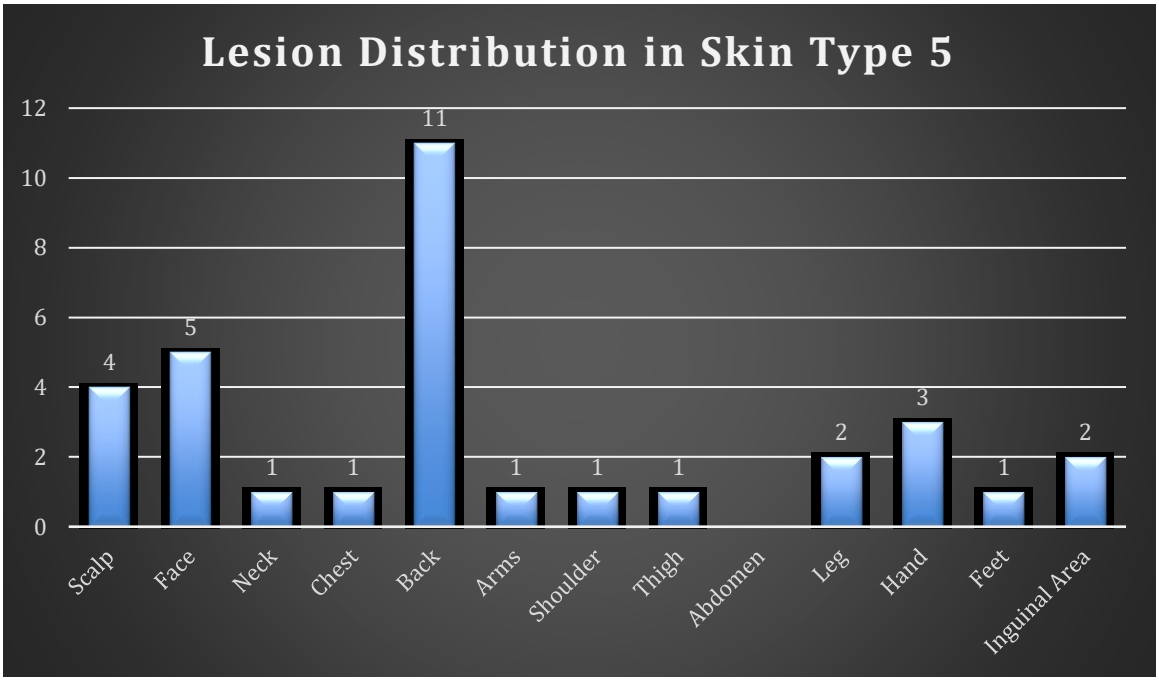


Fig 9. Lesion Distribution in Skin Type 5

- ST 6 patients had 3 SK lesions on the scalp, 6 on the face, 1 on the neck, 1 on the shoulder, 1 on the chest, 1 on the back, 1 on the legs, and 3 on the hand. Fig 10

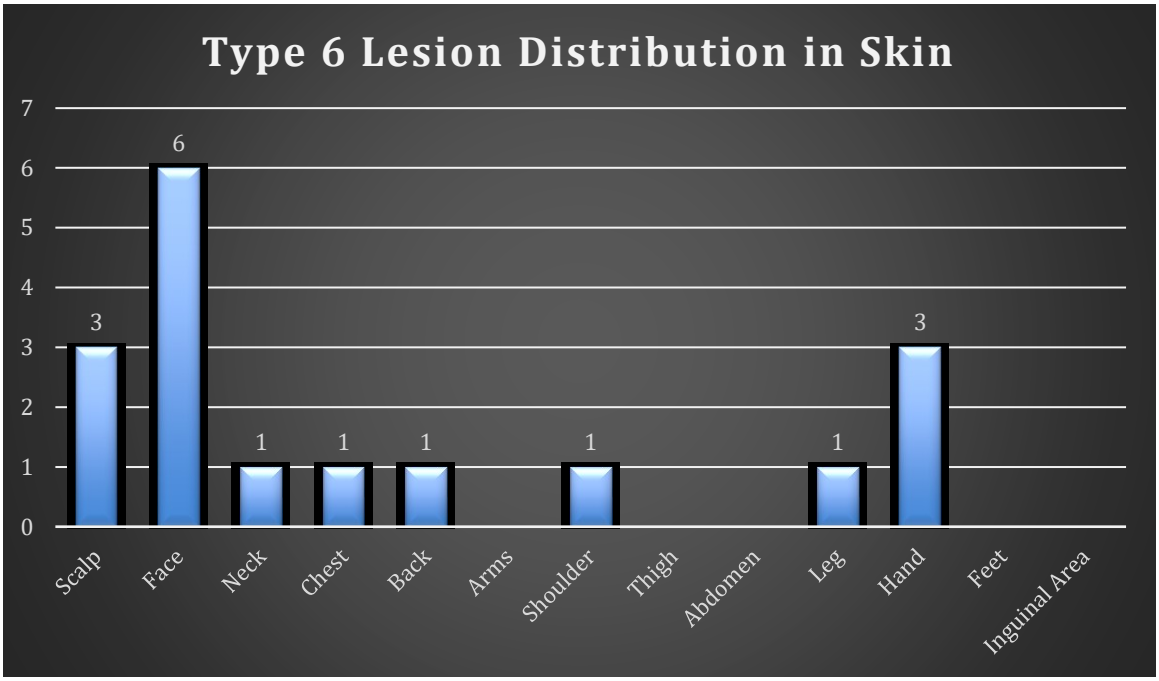


Fig 10. Type 6 Lesion Distribution in Skin

4. Lesion Size

We divided the size of the lesions into three portions, small, medium and large. Less than or equal to 6mm were identified as small, while 6 to 10 mm identified as medium, larger than 10 mm were identified as large.

18 seborrheic keratoses were less than or equal to 6mm in size, 125 were between 6-10mm in size and 57 SK were equal to or larger than 10mm *Fig 11.*

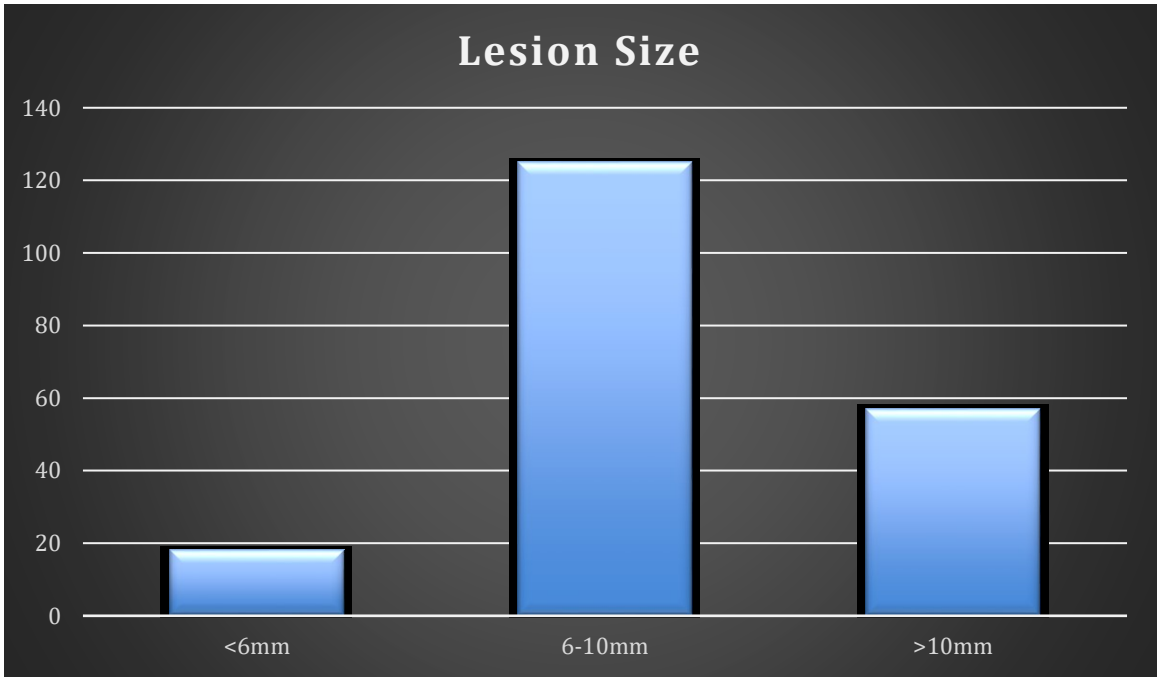


Fig 11. Lesions Size

5. Lesion Size Based on Skin Types

5 patients had Skin Type 1, and 12 images were recorded in this group. Out of 12 Seborrheic keratosis seen in Skin Type 1, 1 was small, 10 were medium and 1 was large in size. 38 images of 28 patients with Skin Type 2 were recorded, of which 5 showed Seborrheic Keratosis of small size, 24 medium size, and 9 had large size Seborrheic Keratosis. Skin Type 3 patients were 31 in number, and a total of 50 images were in this group, of which 4 displayed small Seborrheic Keratosis, 29 medium size, and 17 displayed large-size Seborrheic Keratosis. 50 images of skin type 4 patients were recorded, 4 of which had a small SK, 30 had medium size, whereas 16 had large size Seborrheic Keratosis. Patients with Skin Type 5 were 31, and the overall number of images in this group was 33 ; small Seborrheic Keratosis was seen in 3 SK , 22 were medium size, and large Seborrheic Keratosis was seen in 8 SK . Patients with skin type 6 were 9, out of 17 SK seen 1 was small, 10 were medium size, and 6 were large. *Fig 12.*

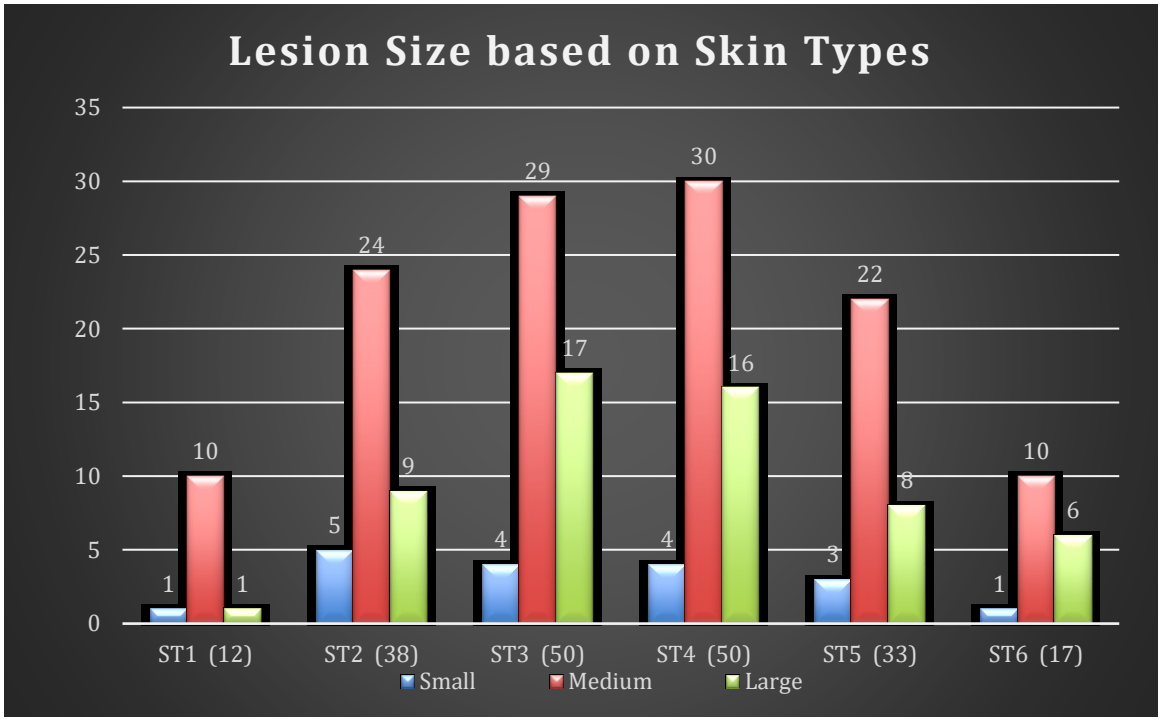


Fig 12. Lesion Size based on Skin Types

6. Pigment Amount

The Seborrheic Keratosis was split into three subgroups according to the degree of pigmentation seen in the dermoscopic images: heavily pigmented, intermediately pigmented, and lightly pigmented. Heavily pigmented seborrheic keratosis was 47, lightly pigmented seborrheic keratosis was 73 and intermediately pigmented seborrheic keratosis was 80.

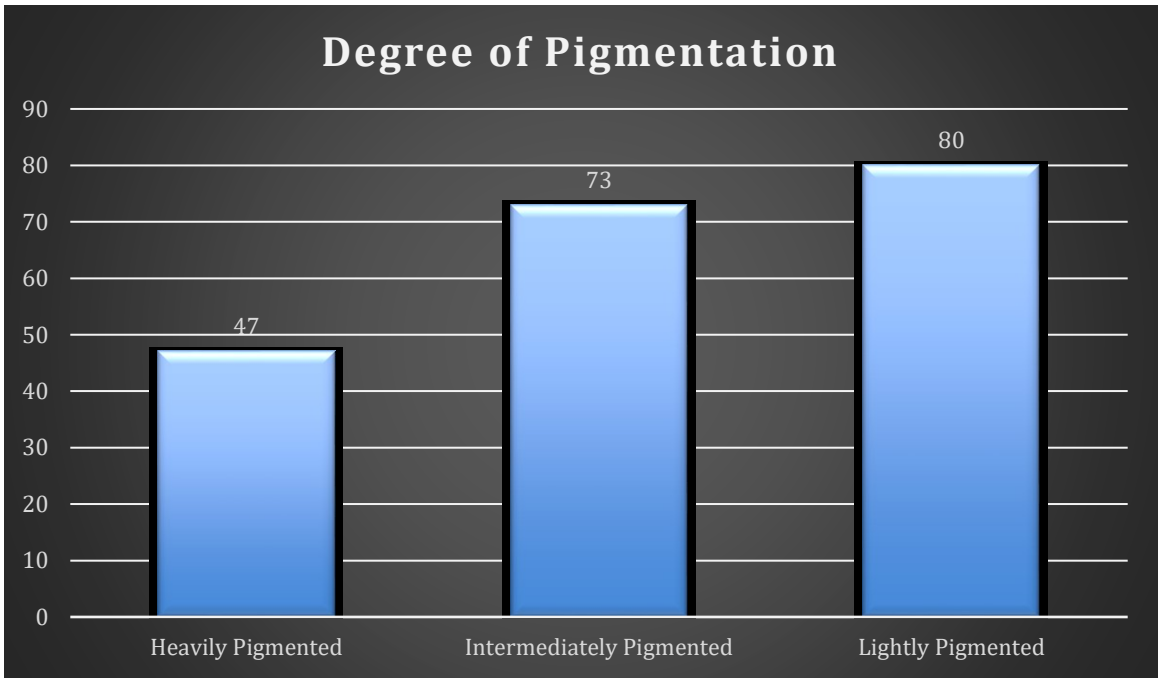


Fig 13. Degree of pigmentation

9. Amount of pigment based on skin type

125 patients with Skin Type 1 had 12 dermatoscopic images, displaying 1 heavily pigmented Seborrheic Keratosis, 2 intermediately pigmented Seborrheic Keratosis, and 9 lightly pigmented Seborrheic Keratosis. 28 patients with skin type 2 had 38 images, displaying 4 Seborrheic Keratosis which were heavily pigmented, 7 were intermediately pigmented and 27 were lightly pigmented. Skin Type 3 patients were 31 in number with a total number of 50 images, in which 7 Seborrheic keratoses were heavily pigmented, 24 were intermediately pigmented, and 19 were lightly pigmented. 21 patients with skin type 4 had 50 images, of which 22 Seborrheic Keratosis were heavily pigmented, 24 were immediately pigmented, and 4 were lightly pigmented.31 patients with skin type 5 had 33 images, of which 13 Seborrheic Keratosis were heavily pigmented, 16 were immediately pigmented, and 4 were lightly pigmented. 9 patients had skin Type 6 and 17 images recorded for them 7 SK were intermediately pigmented and 10 of them were heavily pigmented . *Fig 14.*

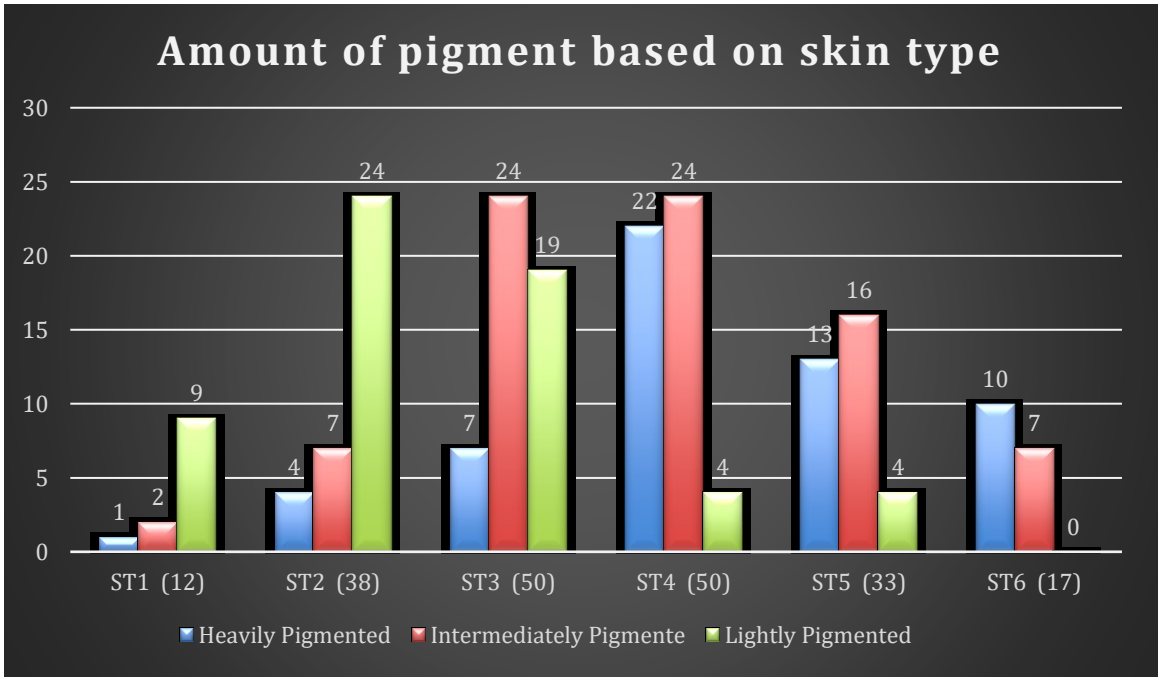


Fig 14. Amount of pigment based on skin type

10. Lesions colors

The color of the Seborrheic Keratosis lesions was divided into various subgroups: light brown, blue, white, yellow, red, dark brown, and black. Light brown Seborrheic Keratosis lesions were 51, dark brown was 66, black was 29, and blue was 12. Yellow-colored Seborrheic Keratosis was 23, white-colored Seborrheic Keratosis was 7, and red was 12 in number.

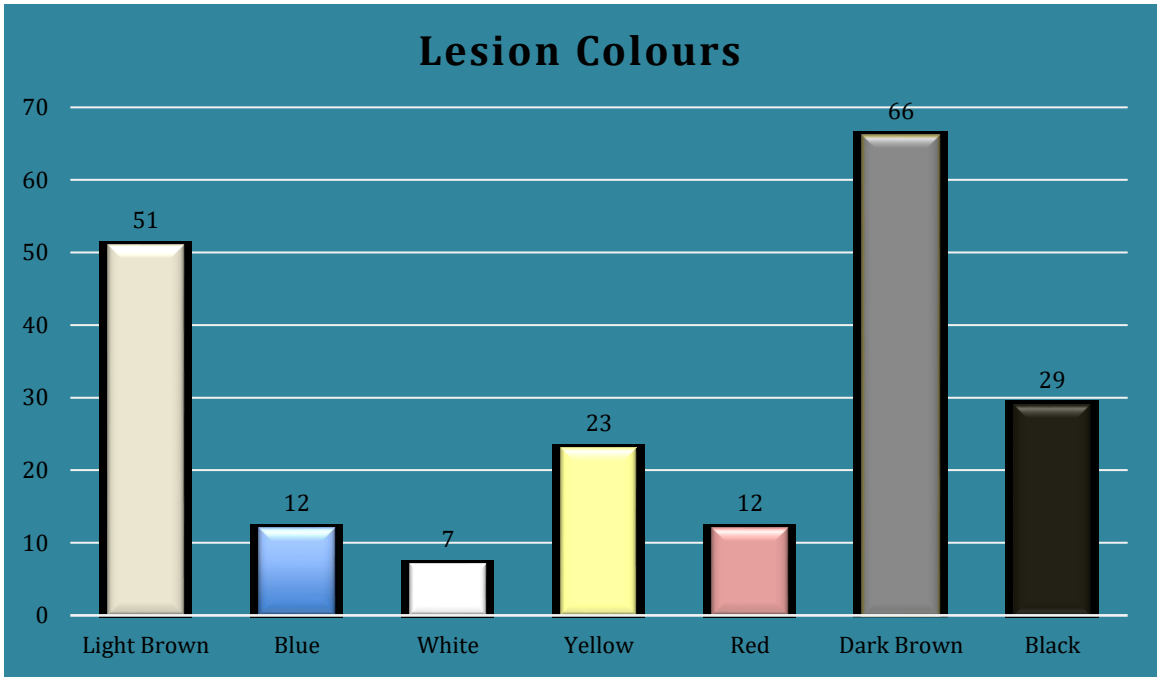


Fig 15. Lesion Colors

11. Lesion Color Based on Skin Type

5 patients with Skin Type 1 had 12 Seborrheic Keratosis images, showing 4 light brown, 3 dark brown, 2 yellow, 1 white, 2 red, black or blue color were not recorded.

28 patients with Skin Type 2 had 38 Seborrheic Keratosis images, with 15 light brown, 9 dark brown, 7 yellow color, 2 black color and 5 red color. blue & white -colored Seborrheic Keratosis were not noted.

31 patients with Skin Type 3 had 50 Seborrheic Keratosis images, which showed 16 light

brown, 21 dark brown, 5 black, 6 yellow, and 2 red colored Seborrheic Keratosis. Blue & white-colored SKs were not noted.

21 patients with Skin Type 4 had 50 Seborrheic Keratosis images, with 13 light brown, 17 dark brown, 7 black, 7 yellow, 2 white-colored SK, 3 Red and 1 Blue colored SK.

31 patients with Skin Type 5 had 33 Seborrheic Keratosis images, showing 3 light brown, 13 dark brown, 8 black, 6 blue, 1 yellow, and 2 white-colored Seborrheic Keratosis. red-colored SK was not noted.

9 patients with Skin Type 6 had 17 SK images showing 3 dark brown, 7 black, 5 blue, and 2 white-colored SK. Light brown, yellow and red-colored SK were not noted. *Fig 16.*

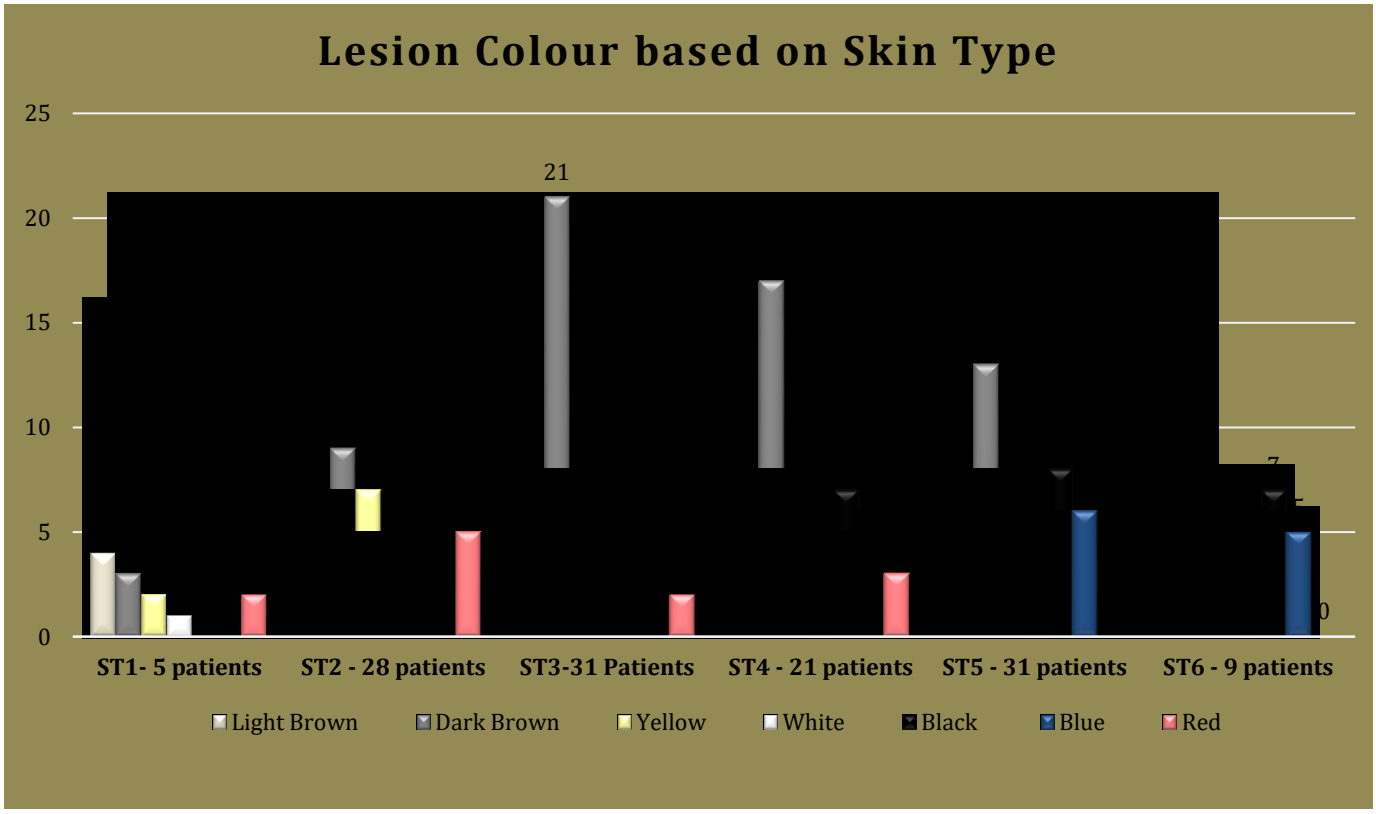


Fig 16. Lesion Color based on Skin Type

12. Local dermoscopic features of Seborrheic Keratosis

Local dermoscopic features of seborrheic Keratosis were considered: Milia-like cysts,Comedo-like openings,Fissures & ridges,Network like structures, Cerebriform pattern (Acanthotic) ,fat fingers,sharp borders, Hairpin blood vessels, moth eaten border ,Flat and Raised seborrheic Keratosis .

Milia-like cyst was seen in 59 dermoscopic images of Seborrheic Keratosis and comedo-like openings in 97 images. Features of Fissures & ridges were seen in 95 Seborrheic Keratosis, Network like structures in 41 SK , Cerebriform pattern were in 69 SK , fat fingers in 29 , Sharp border was seen in 144 Seborrheic Keratosis, Hairpin blood vessels in 29 Seborrheic Keratosis, Moth eaten border in 23 SK , Flat surface count 42 of SK and Raised surface was 158 of Seborrheic keratosis. *Fig 17*

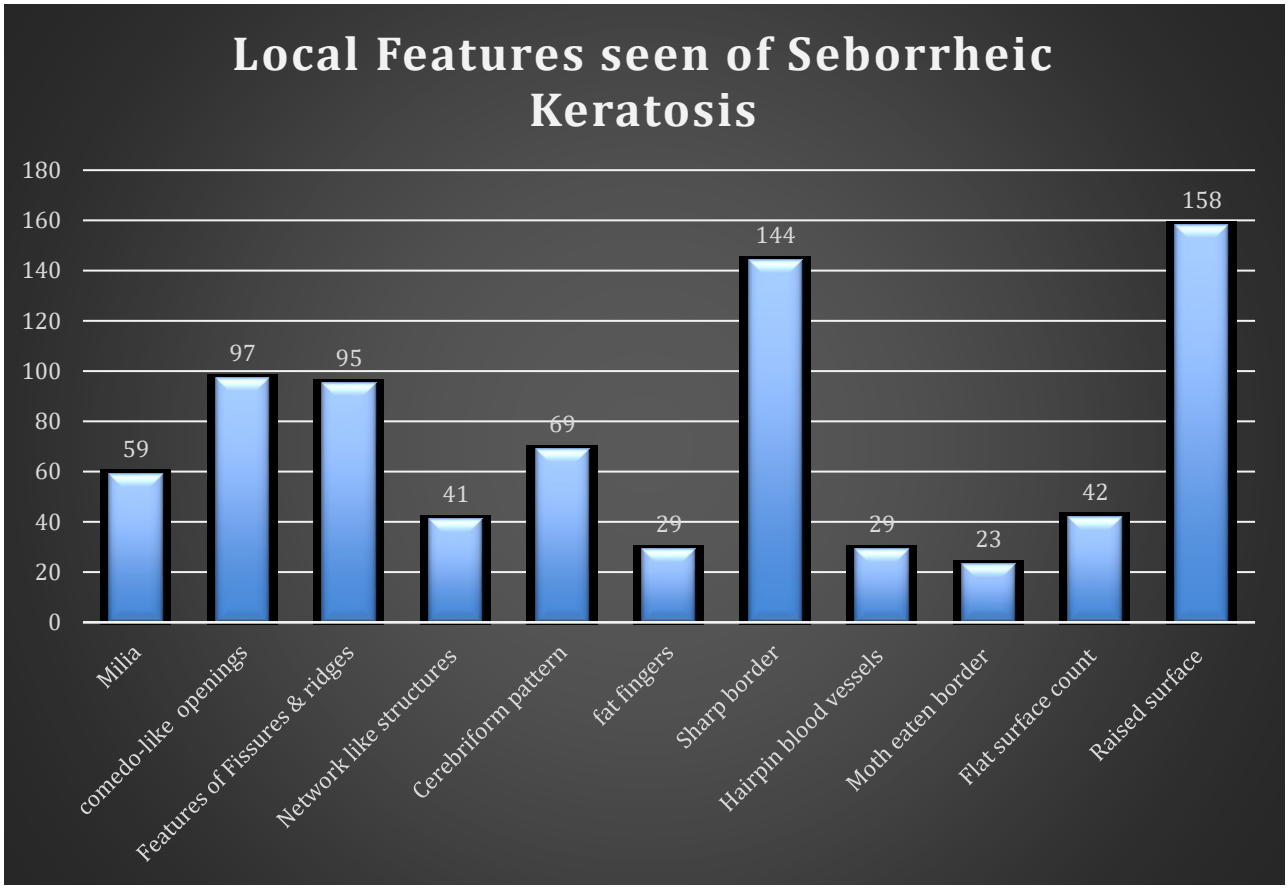


Fig 17. Local Features seen of Seborrheic Keratosis

13. Local Features in Seborrheic Keratosis Based on Skin Type

5 patients with Skin Type 1 showed milia-like cyst in 8 lesions, comedo-like openings in 6 lesions,fissure & ridges in 8 lesions , Network-like in 5 lesions , cerebriform in 3 lesions , Fat fingers in 3 lesions , sharp border in 3 lesions , Hairpin vessels in 7 lesions , moth eaten in 4 lesions , out of 12 lesions 3 were flat while 9 lesions were raised .

38 patients with Skin Type 2 showed milia-like cyst in 10 lesions, comedo-like openings in 14 lesions,fissure & ridges in 22 lesions , Network-like in 13 lesions , cerebriform in 13 lesions , Fat fingers in 10 lesions , sharp border in 25 lesions , Hairpin vessels in 9 lesions , moth eaten in 6 lesions , 12 lesions were flat while 26 lesions were raised .

31 patients with Skin Type 3 showed milia-like cyst in 12 lesions, comedo-like openings in 17 lesions,fissure & ridges in 21 lesions , Network-like in 14 lesions , cerebriform in 13 lesions , Fat fingers in 11 lesions , sharp border in 39 lesions , Hairpin vessels in 6 lesions , moth eaten in 4 lesions , 14 lesions were flat while 36 lesions were raised .

21 patients with Skin Type 2 showed milia-like cyst in 9 lesions, comedo-like openings in 21 lesions,fissure & ridges in 15 lesions , Network-like in 3 lesions , cerebriform in 15 lesions , Fat fingers in 3 lesions , sharp border in 31 lesions , Hairpin vessels in 3 lesions , moth eaten in 6 lesions , 9 lesions were flat while 41 lesions were raised .

31 patients with Skin Type 5 showed milia-like cyst in 15 lesions, comedo-like openings in 25 lesions,fissure & ridges in 13 lesions , Network-like in 2 lesions , cerebriform in 12 lesions , Fat fingers in 2 lesions , sharp border in 29 lesions , Hairpin vessels in 4 lesions , moth eaten in 3 lesions , 3 lesions were flat while 30 lesions were raised .

9 patients with Skin Type 6 showed milia-like cyst in 5 lesions, comedo-like openings in 14

lesions,fissure & ridges in 16 lesions , Network-like in 4 lesions , cerebriform in 13 lesions ,no lesion showed Fat fingers features , sharp border in 17 lesions , no lesion showed Hairpin vessels or moth eaten features , 1 lesion was flat while the rest 16 lesions were raised . *Fig 18*

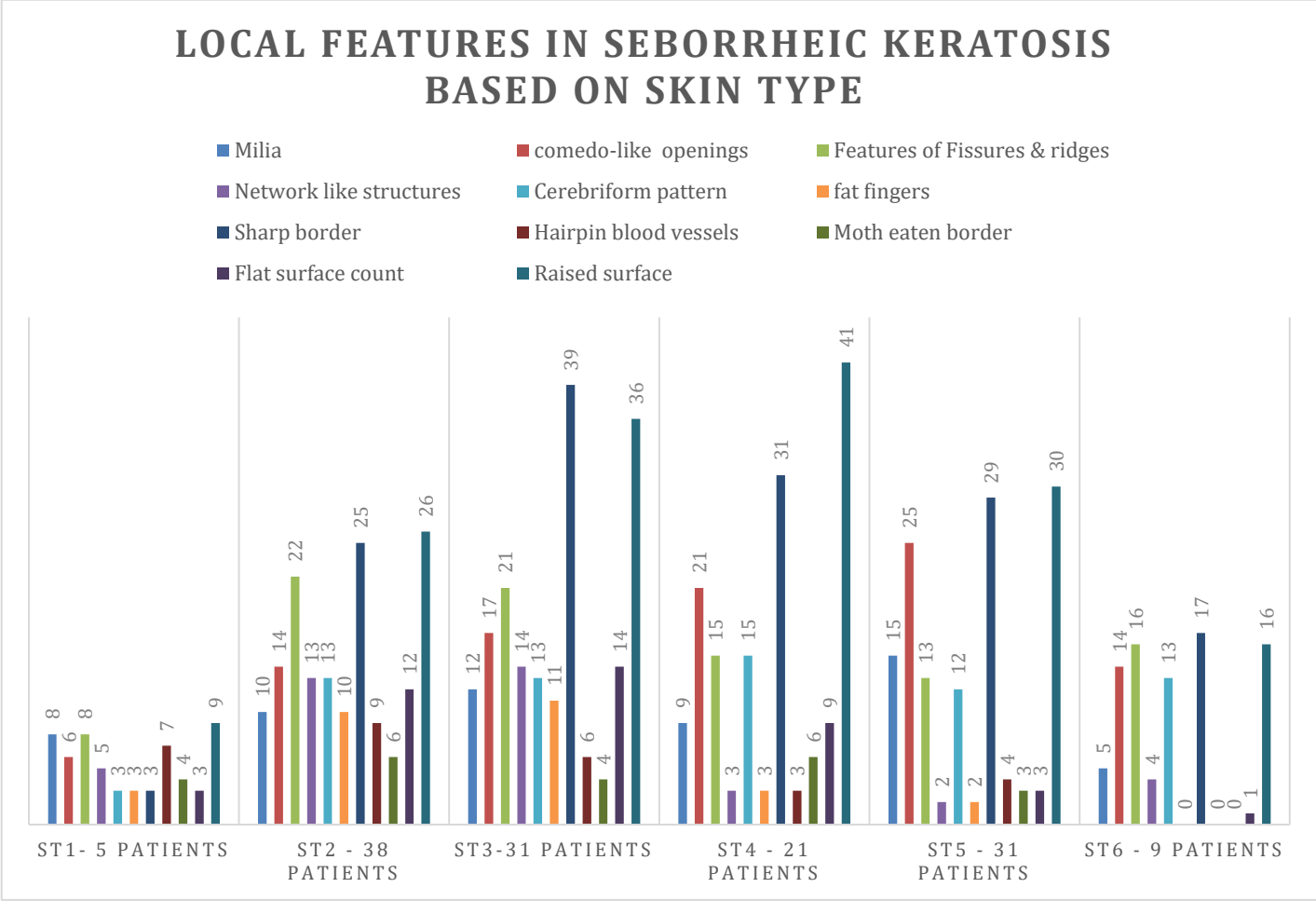


Fig 18. Local Features in Seborrheic Keratosis based on skin type

Research Questions

The research questions were the main targeted questions the report seeks to answer. In our study we tried to understand the Skin Type related differences of Seborrheic Keratosis.

Objectives of the Study

The aim is to expound on different dermoscopic seborrheic Keratosis patterns and to assess any differences in seborrheic Keratosis concerning different skin types in a series of 200 lesions. This was collected from 125 Patients who attended dermatology outpatient clinics in 2 Sites. The study aims to achieve various objectives, including obtaining answers to the following questions.

- How do we understand seborrheic keratosis?
- Why is a skin type understanding to seborrheic Keratosis?

Important and which skin types?

- How are skin type-related differences of seborrheic Keratosis understood in greater context?
- Which concepts apply to different skin types?
- What is a Skin type-related differences are relevant to seborrheic Keratosis?

.

Discussion

200 seborrheic keratoses were collected in total, which:

50 lesions of skin types 1 and 2, 50 lesions from skin type 3, 50 lesions from skin type 4, and 50 lesions from skin types 5 and 6.

Participants were chosen from the outpatient dermatology clinics at Rumaliah Hospital and Graz Hospital From 2001 to 2022.

Some patients have more than one lesion on the back that was included in our study.

The images were taken in an outpatient clinic setting of Rumailah Hospital (Qatar) patients and Graz Hospital (Austria). The image selection was based on seborrheic Keratosis, in which dermoscopic images of patients were taken into account, which was taken in a retrospective period of 20 months.

The result of our study was compared with another similar research, such as

Sadia et al. 2000, Abdel-Azim et al. 2015 and Lin et al. 2014

The youngest patient was 24, and the eldest was 89. Maximum patients were seen in the age range of 54 up to 64. The lowest numbers of patients seen were above 84 of age.
It was believed that Seborrheic Keratosis would typically appear during the fourth and fifth decades [3].

There was a higher number of Seborrheic Keratosis in males, 67 patients, than in females, 58 patients [28]. A Similar finding was by Sadia et al. 2020.

The duration of lesions varies;(10 %) of the patients had the lesions for less than 12 months, (15 %) of the patients had the lesions between 12 months to 24 months, (50 %)of the patients had the lesions between 24 months to 36 months,(25 %) of the patients had the lesions for more than 60 months. We noticed that most of the lesions were presented for years and were unnoticed by patients.

When Seborrheic Keratosis distributions were designed in relation to the skin type, we found indistinguishability in the distribution. The frequency of Seborrheic Keratosis remained high on the back for skin type 1, up to skin type 6, followed by the face and then the chest. A Similar finding was in Sadia et al.

In our study, we noticed that SK could vary in size, as small as 3 mm, and as large as 18 mm. Hence the size of the lesions was divided into three portions, small, medium, and large. Less than or equal to 6mm were considered small, 6 to 10 mm medium, and larger than 10 mm were identified as large.

Medium-size SK dominates in all skin types, followed by large-size SK. We also noticed a steady relationship between size and duration; most of the large-size SK has a longer time duration, especially in ST3, ST4, and ST5 but not sure if this finding will be the same with ST1 and ST6 if we have a larger sample.

Sadia et al. Found that lightly pigmented SKs dominated in their study, followed by intermediate pigmented ones and the least heavily pigmented SKs. We found the same result in our study. Unlike Them, we had a higher number of patients in skin types 3 & 4.

Skin types 2 and 3 showed the highest number of lightly pigmented seborrheic keratosis lesions. While skin types 4,5 and 6 show higher numbers of heavily pigmented seborrheic keratosis. Intermediately pigmented SKs were among skin types 3 and 4 in equal numbers.

The dark brown colored SKs dominated our study group, 66 out of 200 SKs, followed by light brown colored SKs, 51/200, then black and yellow, and the least number was for white-colored SKs. Blue and red were equal in number.

Out of 200 SKs, 12 were blue-colored, dominated by skin type 5&6.

Red-colored SKs dominated in skin type 2, Black-colored SKs dominated skin types 4,5 and 6.

The highest number of yellow-colored SKs were seen in skin types 2,3, and 4.

Anatomical sites differ in many histological aspects and disease preference and predilection. Internally, there is variability between sites due to differences in the thickness of layers of epidermis and dermis, density, and types of adnexal structures such as terminal hair follicles, sebaceous follicles, and sweat glands. These differences are reflected in the dermatoscopic findings and patterns of SK [29].

Sharp Borders had the highest prevalence among the two reviewed studies done by Lin et al. 2014 [30] and Abdel-Azim et al. 2015 [31], as it showed a percentage of (70%) and (82%) respectively. This supports our finding in the study with (72 %) compared to other patterns of seborrheic keratosis (table 1).

The first and most common dermoscopic features described for seborrheic keratosis were comedo-like openings and milia-like cysts [32,33], in our study, Comedo-like openings counts (48 %), the 2nd most common feature after the sharp border pattern 72 % of the total lesions, while Milia-like cysts showed a percentage of (29%) compared to other patterns of SK.

Comedo-like opening and milia-like cysts were considered the most important dermoscopic criteria for diagnosis of seborrheic keratosis in three previous studies done by Lin et al. 2014 [30], Abdel-Azim et al. 2015 [31]and Sadia et al [34], It shown that both of these patterns were present in many patients by (60%) (50%) and (49%), of comedo-like opening respectively. At the same time milia-like cysts were present in (19%), (26%) and (33%) respectively, of the studies.

In 2001 the Consensus NetMeeting on Dermoscopy, a two-step algorithm using multiple milia-like cysts, comedo-like openings, fissures/ridges (brain-like appearance), and light-brown fingerprint-like structures, was proposed for the diagnosis of seborrheic keratosis [35].

In 2002, Braun et al. evaluated the dermoscopic features of 203 pigmented seborrheic keratosis and added additional criteria such as fissures, hairpin blood vessels, sharp demarcation and moth-eaten borders [36].

Fissures and ridges were seen relatively high in Baun et al. and Lin et al. studies by (61%) and (60 %) respectively.

In our study, it represents (47%) of the lesions. However, they may also be seen in nevi with congenital patterns and sometimes in common melanocytic nevi. The presence of multiple fissures might give a "brain-like" appearance to the lesion [37].

The term moth-eaten border was found in (46%) in Braun et al. study, whereas it shows a relatively low percentage (7%) intake Lin et al. study, and they concluded that these features

are more often seen in early seborrheic keratosis (patch type). In our study, Moth-eaten borders were present in (11%), and according to Schiffner et al. [38] they are also seen in solar lentigines. The Network-like structure shown in 40 lesions (20 %), which is relatively high compared to Line et al.(2%), Abdel-azim et al. (1%), and Sadia et al. (4%), which raise the importance of The proper identification of pigment network (diagnostic dermoscopic features for melanocytic skin lesion) and network like structure that may be seen in seborrheic keratosis [39.]

Hairpin blood vessels, were found in 28 lesions (14%) 20 out of 28 lesions were raised; according to Kreusch and Koch [40] they correspond to long capillary loops, commonly seen in keratinizing tumors, and are mainly found at the border or in the periphery of the lesions.

Braun et al. in their study (2002) conclude that milia-like cysts and comedo-like openings are excellent diagnostic criteria for the identification of the majority of seborrheic keratosis, but the use of other criteria (fissures, hairpin blood vessels, sharp demarcation, and moth-eaten border) decrease the risk of misclassification of pigmented seborrheic keratosis and has the potential to improve the diagnostic accuracy of such lesions, especially the challenging cases [36].

Table 1: comparison of seborrheic keratosis patterns with other reviewed articles.

Study	**Our result** 2022	**Sadia et al** 2020	**Abdel-Azim et al** 2015	**Lin et al** 2014
Number of lesions	200	121	50	416
Site	whole skin	whole skin	whole skin	whole skin
Sharp borders	72%	33%	82%	70%
Fissures & ridges	47%	15%	16%	60%
Comedo-like Openings	48%	49%	50%	39%
Moth eaten border	11%	N/A	34%	7%
Milia -like cyst	29%	33%	26%	19%
Network Like structures	20%	4%	1%	2%
Hairpin blood vessels	14%	30%	2%	6%

Study Significance

The study expounds on the understanding of the seborrheic keratosis concept in different skin types, with the concept being clarified, considering its shortcomings and positivity to come up with a possible framework to assist in the countering of the other shortcomings [41]. When dermatologists or any relevant skin care initiatives implement skin treatments, private and public healthcare institutions can use the study result framework.

Study Delimitations

The study's primary focus was on interpreting the seborrheic keratosis idea, considering concepts, definitions, and theories with the inclusion of various continents and sources [42]. However, it can be noted that the information about seborrheic Keratosis, a different skin type, is limited at different levels. The outcome study did not also consider all the given seborrheic keratosis views but relied on specific tools such as classification, dermoscopy features, and

change opinions on skin types. Different ideologies' distinctions, relationships, and perspectives limit the analysis behind seborrheic Keratosis [42]. The skin type differences in the development of seborrheic Keratosis are mainly linked to the changes in developments in systems thinking. The study also has no boundaries in its definition but relies on data collection and analyses, which are clearly defined in dermatology, with particular areas being considered [42]. The research involves redefining or stating seborrheic Keratosis correct terms but instead focuses on a more comprehensive explanation of the general framework notion for designing different solutions to seborrheic Keratosis.

Ethical Consideration

When collecting data from participants, they will be self-assured that the data they give will be used for research purposes only, with their identity being concealed to make them feel secure.

Significance/Contribution

The research relied on a descriptive and diagnostic analysis, which will explain why skin types must embrace the approach of resolving seborrheic Keratosis [43]. Data obtained from interviews, questionnaires, and experiments were used to give inferential statistics that will enable the conducting of quantitative research by obtaining data from quantitative research.

Conclusion

Seborrheic keratosis in males outnumbered females. Lightly pigmented SKs dominate in lighter skin types, while heavily pigmented dominate in darker skin types, mainly affected by the type of melanin available in each skin type.

Dark brown SKS presented in about (33%) of the lesion, followed by light brown SKs (in 25%); the least was for white-colored SKs.

The most common site affected among 200 lesions of SKs was the back, followed by the face. The least was for the neck, feet, and inguinal areas.

The size of SKs can vary from a few millimeters up to 1.8 cm; medium size (6-10) mm was the predominant size in our study.

For the duration of the lesion, we noticed that many lesions could stay for several years before the patient seeks medical advice. Commonest local features were sharp borders followed by comedo-like openings, and the least was Moth eaten border.

References

[1] Ackerman AB, Kerl H, Sanchez J. A Clinical Atlas of 101 Common Skin Diseases. Ardor Screbendi; 2000.

[2] Gill D et al. The prevalence of seborrhoeic keratoses in people aged 15 to 30. Arch Dermatol 2000; 136: 759.

[3] Memon A A, Tomenson J A, Bothwell J, Friedman PS. Prevalence of solar damage and actinic Keratosis in Merseyside population. Br J Dermatol 2000; 142: 1154-1159.

[4] Baumann Leslie S, Andrew Blauvelt, Zoe D. Draelos, et al. Safety and Efficcacy of Hydrogen peroxide topical solution 40% (w/w), in patients with seborrheic keratoses: Results from 2 identical, randomized, double-blind, placebo-controlled, phase 3 studies (A-101-SEBK-301/302). JAAD November 2018; Volume 79, Issue 5, Pages 869–887.

[5] Wollina U. Erbium-YAG laser therapy – analysis of more than 1,200 treatments. Glob Dermatol. 2016; 3(2):268-272.

[6] Marwa Bouhamed, Dhouha Bacha, Fadoua Abdelmoula, Sana Ben Slama, Ahlem Lahmar, Saadia Bouraoui, Mzabi-Regaya Sabeh. Clonal Seborrhoeic Keratosis: a rare skin tumour. Pan African Medical Journal. 2019; 34:54.

[7] Papageorgiou C, Spyridis I, Manoli S, Busila I, Nasturica I, Lallas K, Panagopoulou A, Papadimitriou I, Sideris N, Gentsidi T, Gonzalez-Cuevas R, Ilieva A, Ioannides D, Apalla Z, Lallas A. Accuracy of dermoscopic criteria for the differential diagnosis between irritated seborrheic Keratosis and squamous cell carcinoma. J Am Acad Dermatol 2020. Article in press. https://doi.org/10.1016/j.jaad.2020:2- 19.

[8] Wang L, Xu A E Skin. Evaluation of Irritated-Seborrheic Keratosis by in vivo reflectance confocal microscopy. Research and Technology 2013; 19: 358–360.

[9] Julian Penev, Milla Balabanova, Ilko Bakardzhiev. Strategy of Aesthetic Laser Removal of Multiple Seborrheic Keratosis and Effects on Appearance' Self-Esteem and Well-Being. Clin Res Dermatol Open Access 6(4): 1-9.

[10] D Mehrabi, R Brodell. Use of the Alexandrite Laser for Treatment of Seborrheic Keratoses. Dermatologic Surgery. May 2002 28(5):437–439.

[11] Li Y, Wang Y, Zhang W, Jiang L, Zhou W, Liu Z, Li S, Lu H. Overexpression of Amyloid Precursor Protein Promotes the Onset of Seborrhoeic Keratosis and is Related to Skin Ageing. Acta Derm Venereol. 2018; 98(6):594-600.

[12] Zaballos P, Blazquez S, Puig S, Salsench E, Rodero J, Vives JM, Malvehy J. Dermoscopic pattern of intermediate stage in seborrheic Keratosis regressing to lichenoid Keratosis: report of 24 cases. Br J Dermatol Aug 2007; 157: 266-272.

[13] Stricklen SM, Stoecker WV, Oliviero MC, Rabinovitz HS, and Mahajan SK. Cloudy and Starrymilia like cysts: how well do they distinguish seborrhoeic Keratosis from malignant melanomas? JEADV 2011 Oct; 25(10):1222- 4.

[14] Braun RP, Scope A, Maghroob AA. The blink sign in dermoscopy. Arch Dermatol 2011; 147: 520.

[15] Changchien L, Dusza S W, Agero A L C, Korzenko AJ, Braun R P, Sachs D, Usman M H U, Halpern A C, Marghoob A A. Age- and Site-Specific Variation in the Dermoscopic Patterns of Congenital Melanocytic Nevi. An Aid to Accurate Classification and Assessment of Melanocytic Nevi. Arch Dermatol Vol 143 (No. 8), Aug 2007

[16] C Belluci, F Arginelli, S Basolli, C Magnoni, S Seidenari. Dermoscopic yellow structures in Basal Cell Carcinoma. JEADV 2014 May: Vol 28, Issue 5: 651-654.

[17] Marghoob A A, Malvehey J, Braun R P. Ahlgrimm-Siess V, Cao T, Oliviero M, Hofmann-Wellenhof R, Rabinovitz H S, Scope A. The vasculature of non-melanocytic skin tumors in reflectance confocal microscopy, II: vascular features of seborrheic Keratosis. Dermatol 2010; 146:694-695.

[18] Yeatman J M, Kilkenny M, Marks R. The prevalence of Seborrheic Keratosis in an Australian population: does exposure to sunlight play a part in their frequency? Br J Dermatol 1997; 137: 411-414.

[19] Ahlgrimm-Siess V, Can T, Oliviero M, Laimer M et al. Seborrhoeic Keratosis: Reflectance confocal microscopy features and correlation with dermoscopy. J AM Acad Dermatol 2013 July; 69 (1): 120-126.

[20] Ralph Peter Braun, MD; Harold S. Rabinovitz, MD; Joachim Krischer, MD; et al. Dermoscopy of Pigmented Seborrhoeic Keratosis, a morphological study. Arch Dermatol 2002; 138(12): 1556-1560.

[21] Longo C, Zalaudek I, Moscarella E, Lallas A, Piana S, Pellacani G, Argenziano G. Clonal seborrheic keratosis: dermoscopic and confocal microscopy characterization. JEADV 2014, 28, 1397–1400.

[22] Soyer, H. Peter, et al. "Dermoscopy of pigmented skin lesions." EJD 11.3 (2001): 270-276.

[23] Squillace, Lorenzo, et al. "Unusual dermoscopic patterns of seborrheic keratosis." Dermatology 232.2 (2016): 198-202.

[24] Dourmishev L A, Draganov P V. Paraneoplastic dermatological manifestations of gastrointestinal malignancies.World J Gatroenterol 2009; 15: 4372-4379.

[25] Constantinov C, Dancea H, Meade P. The sign Leser Trelet in Colorectal adenocarcinoma. Am Surg 2010; 76: 340-341.

[26] Turan E, Gurel M S, Erdemir A T. Leser Trelet Sign- a paraneoplastic process? Cutis 2014 NOV; (94): 14- 15.

[27] Schwengle L E M, Rampen F H J, Wobbes T H. Seborrhoeic Keratosis and internal malignancies. A case control study. Clinical and Exp Dermatol 1988; 13: 177-179.

[28] Porto A C S, Blumetti T P, De Mecedo M P, Braga J C T. Melanoacanthoma: a potential pitfall of reflectance confocal microscopy. An Bras Dermatol, 2019; 94 (6): 747-750.

[29] Fonseca M, Marchetti M a., Chung E, Dusza S w., Burnett M e., Marghoob A a., et al. Cross-sectional analysis of the dermoscopic patterns and structures of melanocytic naevi on the back and legs of adolescents. Br J Dermatol. 2015 Dec 1;173(6):1486–93.

[30] Lin J, Han S, Cui L, Song Z, Gao M, Yang G, et al. Evaluation of dermoscopic algorithm for seborrhoeic keratosis: a prospective study in 412 patients. J Eur Acad Dermatol Venereol. 2014 Jul 1;28(7):957–62.

[31] Abdel-Azim AA, Ahmed NA, Hamid GE-DA, Moaty NTA. Role of dermatoscope in diagnosing and differentiating different types of seborrheic keratoses. Egypt J Dermatol Venerol. 2015 Jul 1;35(2):75.

[32] Menzies SW. An Atlas of Surface Microscopy of Pigmented Skin Lesions: Dermoscopy. McGraw Hill Professional; 2003. 188 p.

[33] Kenet RO, Kang S, Kenet BJ, Fitzpatrick TB, Sober AJ, Barnhill RL. Clinical Diagnosis of Pigmented Lesions Using Digital Epiluminescence Microscopy: Grading Protocol and Atlas. Arch Dermatol. 1993 Feb 1;129(2):157–74.

[34] Sadia et al. https://online.medunigraz.at/mug_online/wbAbs.getDocument?pThesisNr=59860&pAutorNr=&pOrgNr=1

[35] Argenziano G, Soyer HP, Chimenti S, Talamini R, Corona R, Sera F, et al. Dermoscopy of pigmented skin lesions: Results of a consensus meeting via the Internet. J Am Acad Dermatol. 2003 May;48(5):679–93.

[36] Braun RP, Rabinovitz HS, Krischer J, Kreusch J, Oliviero M, Naldi L, et al. Dermoscopy of pigmented seborrheic keratosis: a morphological study. Arch Dermatol. 2002 Dec;138(12):1556–60.

[37] Hirata SH, Almeida FA, Tomimori-Yamashita J, Enokihara MS, Michalany NS, Yamada S. “Globulelike” dermoscopic structures in pigmented seborrheic keratosis. Arch Dermatol. 2004 Jan;140(1):128–9.

[38] Schiffner R, Schiffner-Rohe J, Vogt T, Landthaler M, Wlotzke U, Cognetta AB, et al. Improvement of early recognition of lentigo maligna using dermatoscopy. J Am Acad Dermatol. 2000 Jan;42(1 Pt 1):25–32.

[39] Ayhan E, Ucmak D, Akkurt Z. Vascular structures in dermoscopy. An Bras Dermatol. 2015;90(4):545–53.

[40] Kreusch J, Koch F. Auflichtmikroskopische Charakterisierung von Gefäßmustern in Hauttumoren. Hautarzt. 1996 Apr 1;47(4):264–72.

[41] Grimes P E, Arora S, Minus H R, Kennedy Jr J A. Dermatosis Papulosa Nigra. Cutis 1983 Oct;(4): 385- 392.

[42] Bhat R M, Patrao N, Monteiro R, Sukumar D. A clinical, dermoscopic and histopathological study of DPN- an Indian perspective. Int J Dermatol 2017, 56, 957-960.

[43] Hafner C, Vogt T. Seborrheic Keratosis. JDDG; 2008, Aug;6(8):664-677.