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Epidemiology and Pattern of Presentation of Keloids at a Tertiary Hospital in Southern Nigeria

¹Isamah CP, ¹Akpomiemie MO, ^{1,2}Otene CI

¹Division of Plastic and Reconstructive Surgery, Department of Surgery, Delta State University Teaching Hospital, Oghara, Nigeria.

²Department of Surgery, College of Health Sciences, Delta State University, Abraka, Nigeria.

Corresponding author: Chinsunum Peace Isamah, Division of Plastic and Reconstructive Surgery, Department of Surgery, Delta State University Teaching Hospital, Oghara, Nigeria; peaceisamah@gmail.com; +2348022863176

Article history: Received 22 July 2024, Reviewed 3 September 2024, Accepted for publication 10 September 2024

Abstract

Background: Keloid scar is an unpleasant complication of wound healing. It could involve lesions that are cosmetically unpleasant, as well as symptomatic lesions. The common symptoms are pain and pruritus. There is paucity of data on the epidemiology and pattern of presentation in Nigeria. This study assessed the epidemiology and pattern of presentation of keloid scar in a teaching hospital southern Nigeria.

Method: Retrospective review of patients attending plastic surgery clinic between May 2021 and December 2023. The demographic and clinical characteristics of the patients were extracted from the records and analysed.

Result: A total of 37 patients were included, with a median age of 25 years. Most of the patients (54.1%) were females. Majority (64.9%) were single, while a quarter of the patients had family history. Patients were largely from Urhobo (45.9%), Ukwuani (16.2%), and Ika (10.8%) ethnic groups. The median duration of keloid was 24 months. Ear (35.1%), chest (10.8%), suprapubic (10.8%), and jaw/neck (10.8%) were the common locations. Most of them had a single keloid (59.5%). Cosmesis (55.6%) was the commonest reason for presentation. Among those with symptoms, pruritus (38.9%), pain (27.8%) were the common symptoms. Ear piercing (32.4%), trauma (29.7%), and shaving (18.9%) were the leading causes of keloid. Less than half (43.2%) had received treatment prior to presentation, with most (75%) receiving a unimodal treatment.

Conclusion: The most common location of keloid was the ear, with piercing as the commonest cause. Pruritus is the leading symptom of keloid scar.

Keywords: keloid, epidemiology, keloid presentation, causes of keloid, keloid locations.



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How to cite this article:

Isamah CP, Akpomiemie MO, Otene CI. Epidemiology and Pattern of Presentation of Keloids at a Tertiary Hospital in Southern Nigeria. The Nigerian Health Journal 2024; 24(3):1535-1542.

<https://doi.org/10.60787/tnhj.v24i3.875>



Introduction

Keloids represent an unpleasant and disfiguring complication in the spectrum of wound healing. It is fibroproliferative lesion involving scar tissues formed during cutaneous wound healing.^{1,2} These lesions follow injuries with a depth involving the dermis where fibroproliferation is part of the process of healing unlike injuries just involving the epidermis. Keloids are firm, often nodular lesions.

They are characterised by a growth pattern that is beyond the border of the original injury.³ this growth pattern is likely due to the exaggerated fibroproliferative response to injuries in these patients that are predisposed to keloid formation. The initial injury might be a minor, often neglected trauma. However, they are commonly due to chronic inflammation from ear piercing, repeated trauma from shaving, burn injuries, insect bites, lacerations, and following surgical incisions.^{4,5,6}

Keloids can occur anywhere in the human body, with the palm and soles of the feet being rare sites. The common sites are the chest, earlobes, jaws, upper arm, and breast.^{1,3,7} The identified risk factors for keloid scars include race, family history, increased wound tension, blood group A, young age, previous history of keloid in the same individual, and healing by second intention.^{1-3,7} When these lesions develop, they can be a source of emotional distress. The common physical symptoms of keloid are pain, pruritus, and purulent discharge.^{4,7}

There is a paucity of literature on the epidemiology and presentation of keloid in southern Nigeria. This study was therefore carried out to determine the basic epidemiology and pattern of presentation of keloid in a tertiary hospital southern Nigeria.

Method

This was a retrospective review of all patients with keloids who presented to the plastic surgery clinic between May 2021 and December 2023. The study was carried out in accordance with the ethical standards following the Helsinki declaration and its subsequent modifications.

Study Setting

The facility is the only teaching hospital in Delta state, southern Nigeria. The hospital serves a state with a population of over 5million people.⁸ It also receives referrals from neighbouring Edo state also in southern Nigeria.

Study Design

This was an observational descriptive study. The unit database of patients managed with keloid scar was reviewed and data extracted into a questionnaire.

Study Population

The study was a total population study. All patients with clinical diagnosis of keloid scar were included in this study. The diagnosis of keloid is made following history and physical examination. Those that were managed with surgical excision have additional histological confirmation in line with the unit protocol.

Variables and data collection

The variables include age of patient, gender, location and number of keloids, reason for presentation. The occurrence of symptoms, the symptoms, blood group, family history of keloid, and the cause of keloid. Other variables include previous treatment received, and treatment received in this facility. These variables were extracted into a questionnaire.

Data Analysis

The data analysis was done using the statistical package for social sciences. Inferential statistics was done to determine the relationship between keloid location and reason for presentation, the duration of keloid and age less than or greater than 30 years of age. Inferential statistics was done with Chi square test at 95% confidence with a $P < 0.05$ being statistically significant. Results were presented in table and charts.

Results

A total of 37 patients with 57 keloids were seen during the study period. Females constituted 54.1% of the population, while males accounted for 45.9%. The median age of the patients was 25 years, with a range of 4 to 71 years. Most of the patients were from the Urhobo ethnic group, table 1.

Table 1. Distribution of patients by tribe

Tribe	Frequency	Percentage
Urhobo	17	45.9
Ukwuani	6	16.2
Esan	4	10.8
Ibo	2	5.4
Itsekri	1	2.7
Isoko	3	8.1
Ika	4	10.8

Most of the patients had a single keloid, figure 1, with the ear as the most common site of keloid formation (figure 2). More than half (56.8%) of the patients presented due to cosmesis, while 43.2% presented due to symptoms. Pruritus (38.9%) and pain (27.8%) were the leading symptoms of keloid, figure 3.

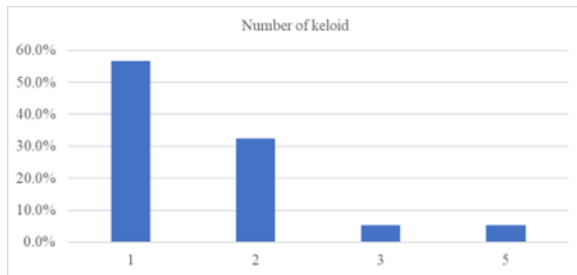


Figure 1: Distribution of number of keloids per patient. Most patients had a single keloid

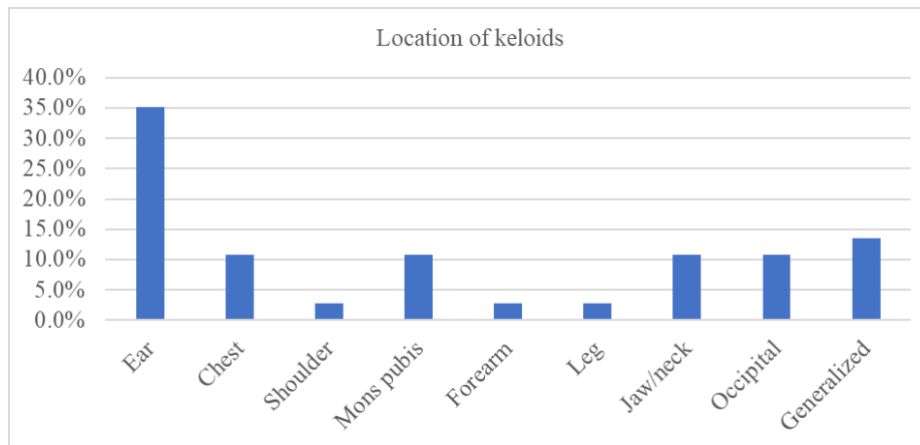


Figure 2: Location of keloids. The ear is the most common location of keloids

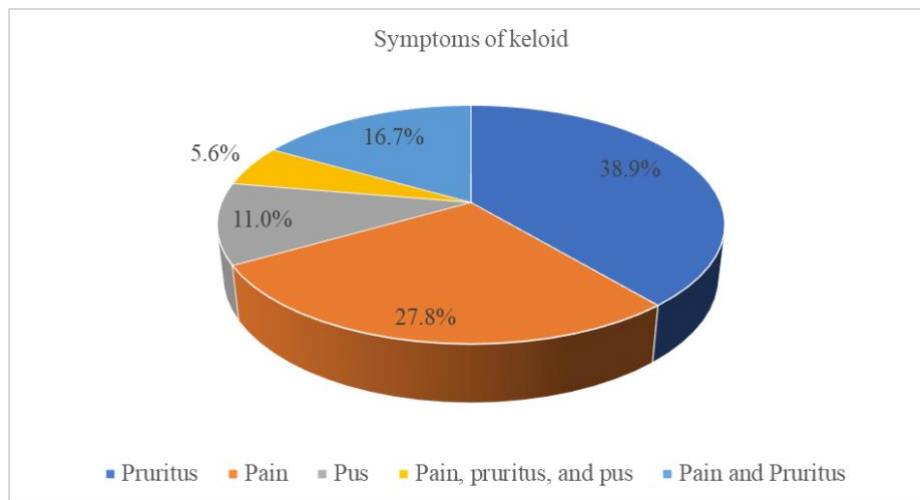


Figure 3: Distribution of keloid symptoms showing pruritus as the most common symptom of keloid

Ear piercing was the most common cause of keloid, figure 4. Majority (74.3%) of the patients had no family history, while 25.7% reported a family history of keloids. Among those with known blood groups (n=11), most were blood group o (n=9, 81.8%), while blood group A accounted for 18.2% (n=2). Less than half (43.2%) received previous treatment, 48.6% had no treatment, with 2.7% missing data. Majority (75%) of them had

unimodal treatment (surgical excision, 43.8%; triamcinolone injection, 25%; and silicone sheet, 6.2%), while 25% had surgical excision combined with intralesional triamcinolone injection. Those with trunk and lower limb keloids were more likely to present with symptoms, while those with head and neck and upper limb keloids were more likely to present due to cosmesis, $P=0.02$, figure 5. Patients younger than or equal to 30

years of age were more likely to present with keloid duration lasting less than 24 months, $P=0.012$, figure 6. A total of 26 patients (70.3%) received treatment. The treatment received were surgical excision and intralesional triamcinolone injection ($n= 20$, 76.9%),

intralesional triamcinolone ($n=3$, 11.5%), and surgical excision ($n=3$, 11.5%). Those who received surgical excisions alone were lost to follow up and therefore could not receive any adjuvant care.

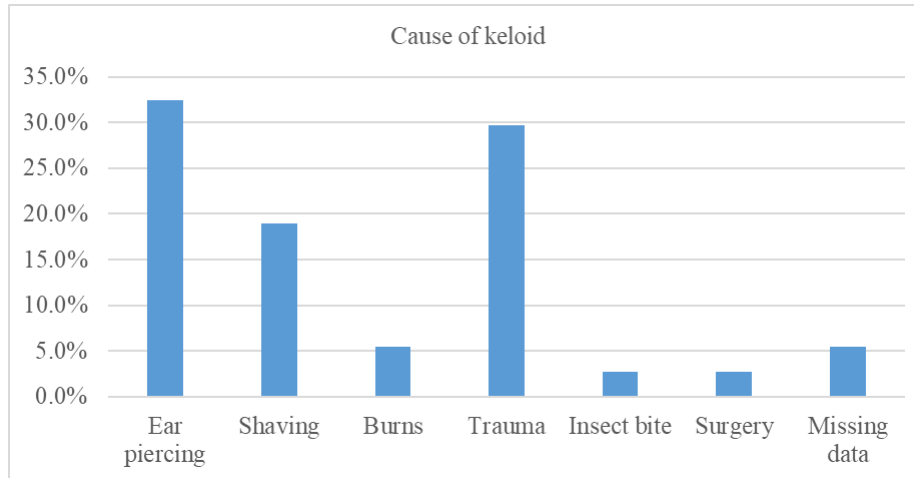


Figure 4: Causes of keloid. Ear piercing, trauma, and shaving are the leading causes of keloid in order of decreasing frequency.

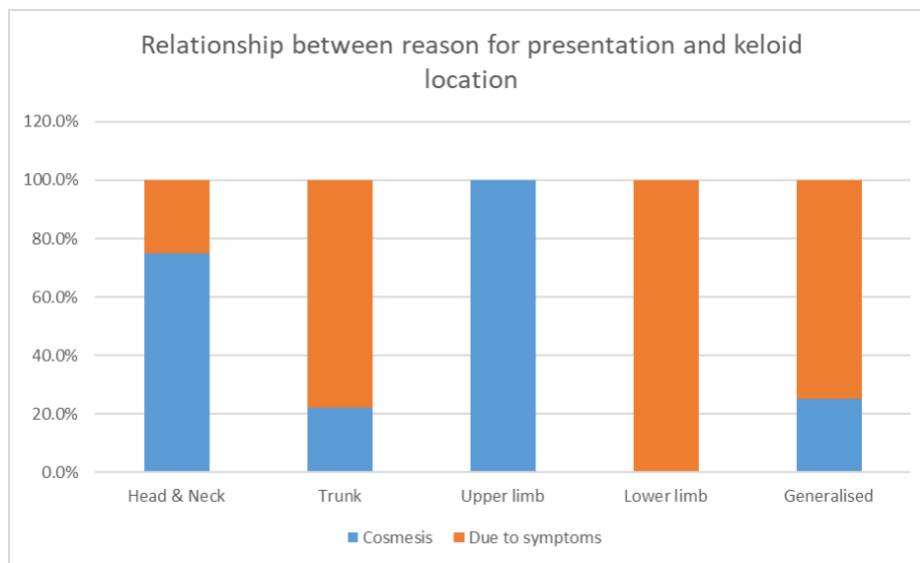


Figure 5: Relationship between keloid location and reason for presentation.

Patients with lower limb and trunk keloids were more likely to present with symptoms. $X^2=11.5$; $P=0.022$

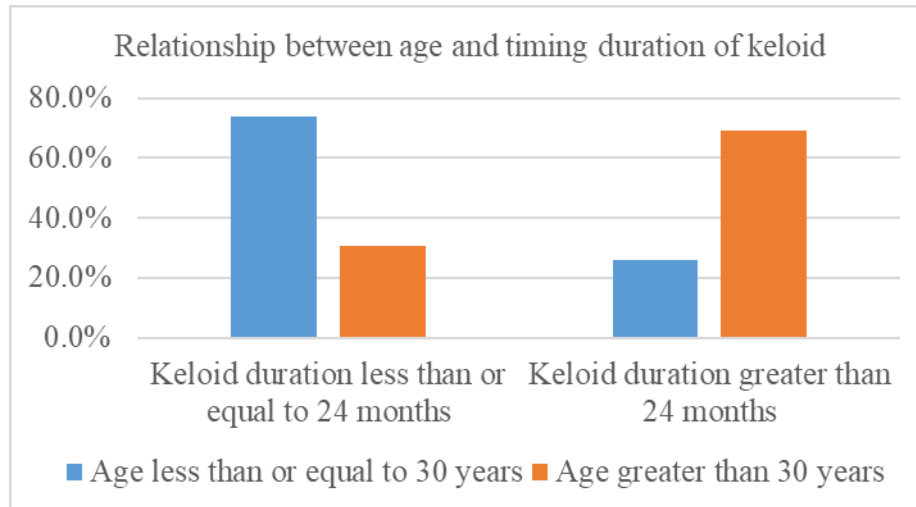


Figure 6: relationship between age and duration of keloid at presentation.

Those less than or equal to 30 years of age had keloids less than or equal to 24 months duration at time of presentation. $\chi^2=6.4$; $P=0.012$

Discussion

The study found a female preponderance (54.1%), with a median age of 25 years. More than 50% of the patient had single keloid and the ear was the most common location of keloid. The most common cause of keloid was ear piercing. Most of the patients presented due to cosmesis (56.8%), pruritus (38.9%) was the most common symptom. A quarter of the patient (25.7%) reported a family history. Patients who were younger than 30 years had shorter duration of symptoms prior to presentation ($P=0.012$). The study also found that the location of keloid correlated with reason for presentation ($P=0.02$). More than two thirds of the patient received treatment following presentation.

The median age of 25 years is in keeping with the report by Olabanji et al.⁹ who reported a median age of 27 years. Similarly, Abdus-salem et al.¹⁰ from Ibadan and Ud-Affah et al.¹¹ from Calabar found that most patients with keloids were less than 30 years of age. Alo et al.⁵ reported a mean age of 36.3 years, while Olopenia¹² reported 34.2 years. With trauma, and adventures such as body piercing common causes of keloid, this young age of occurrence is not therefore surprising. These adventures and trauma are more common in the young population. Additionally, the young population might be more likely to present to the hospital with keloids due to the perceived impact on their physical appearance. This is supported by another finding in this study that shows a statistically significant relationship between age and duration of presentation, with those younger than 30years presenting to the hospital earlier due to the

keloid. It is possible therefore, that the older population with asymptomatic keloid do not present to the hospital and therefore live with it in the community.

There was a slight female preponderance in this study. This is similar to previous reports and is probably due to differences in healthcare seeking behaviour as well as the cosmetic impact of keloid.^{9,13-17} Anaba et al.⁶ however reported a male preponderance with males accounting for 56% of their study population. Anaba et al.⁶ theorised that the male preponderance was probably due to the high incidence of trauma as the cause of the keloid in their study population. Abdus-salem et al.¹¹ reported more males in their study cohort, though no reason was given for this, however, the study was among those receiving radiotherapy.

Approximately one quarter of the patients had a family history of keloid, with blood group O being the most common blood group. These patients presented at a median duration of 24 months. The family history rate is similar to the 23% reported by both Anaba et al.⁶ and Ibrahim et al.¹⁸, but lower than the 41.5% reported by Belie et al.¹⁷ The studies by Belie et al.¹⁷ and Anaba et al.⁶ were carried out in Lagos, southwestern Nigeria, therefore the ethnicity or study population is unlikely to account for such differences. The study by Ibrahim et al.¹⁸ was carried out in Zaria, northwestern Nigeria. Blood group A is known to be associated with keloid formation.^{7,11} However, our study found blood group O to be more common than blood group A. the reason for

the above difference is unclear and will benefit from further investigation.

The most common cause of keloid in this study was ear piercing, followed by trauma and shaving. It follows then, that earlobe keloid was the commonest location of keloid in this study. Additionally, trauma mostly resulted in chest keloid, and shaving a major cause of keloids located in the mons pubis. This is in contrast with the report by Belie et al.¹⁷ where trauma and acne were the leading causes of keloid, with the trunk reported as the most common site of keloid formation. Olasode et al.¹⁶ also reported the chest as the most common location of keloid possibly due to increased wound tension. Similarly, Alao et al.⁵ found the chest as the most common location of keloid followed by the earlobe. With these ear piercings often done in adolescent years, it might be necessary to provide these extra piercing in younger years when the dermal fibroproliferation will be less exaggerated. This is supported by the report by Ibrahim et al.¹⁸ from Zaria that showed the second and third ear piercings as the causes of ear keloids. The study by Ibrahim et al.¹⁸ involved 60 patients with 108 earlobe keloids. It showed that second and third piercings were more commonly done between 13 and 18 years of age, with the next common age being after 18 years of age. Therefore, providing the extra piercing before the teenage years might be helpful in reducing the incidence of earlobe keloids. Alternatively, piercing by a professional should be encouraged to reduce the level of trauma and the subsequent dermal fibroproliferation that results in keloid formation.

The most common reason for presentation is cosmesis, however, when symptom does occur, the commonest symptom was pruritus. Those lesions located in the lower limbs and trunks were more likely to be symptomatic, while those lesions located in the head and neck and upper limb were more likely to present due to cosmesis. This relationship between keloid and location and reason for presentation was statistically significant. Belie et al.¹⁷ found the common presentations as cosmetic followed by pruritus. They also reported the trunk as the most common location of symptomatic keloid which is similar to our study. Our study however found no statistically significant relationship between family history and symptomatology contrary to the report by Belie et al.¹⁷ This might be due to the smaller sample size in our study.

Most of those who received treatment in other facilities prior to presentation in our facility had unimodal treatment, with surgical excision being the most common. These lesions are best treated with multimodal

regimen to reduce the rate of recurrence.^{1,2} In this study cohort, 70.3% received treatment, with the vast majority (76.9%) receiving a combination therapy involving surgical excision and intralesional triamcinolone injection. Following excision, these injections are administered 3 to 4 weeklies for 6 to 8 doses. Patients are then followed up, and the intralesional injections resumed if there is recurrence or lesion was yet to completely resolve. Three patients had surgery and defaulted from the adjuvant intralesional triamcinolone, while the other three had small lesions that were amenable to intralesional triamcinolone therapy alone. Olopoenia et al.¹¹ reported that a large proportion of keloids were untreated. The authors noted that in those who were treated, medical therapy in 51.5% and surgical excision in 10.6% were the treatment commonly received. Anaba et al.⁶ reported treatment completion rate of 80% with triamcinolone acetonide monotherapy (92.65%), surgical excision and triamcinolone acetonide (5.89%), and surgical excision alone accounting for 1.50% being the treatment received.

Implications of the findings of this study

This study found that most of the patients that received treatment prior to presenting in this facility had unimodal treatment, mainly surgical excision. Unimodal treatment with surgical excision has been noted to result in a high recurrence rate, therefore surgery is usually combined with other forms of treatment. There is a need for inclusion of keloid management in the continuing medical education (CME) programs by the local and regional branches of the Nigerian Medical Association in order to improve outcome and reduce recurrence.

The association of keloid location with symptoms is an important point to remember in the management of wounds and scars in the chest and extremities. Early and appropriate wound management, and proper scar modulation techniques will be invaluable in reducing the incidence of keloid scars.

Lastly, the prevalence of blood group O in this study compared blood group A as reported by studies outside Nigeria requires a larger prospective study to elucidate the relationship between blood group and keloid. This will be useful in education and preventive measures.

Limitations of the Study

The retrospective nature of this study limited the available data on the relationship between blood group and keloid formation. Whereas previous studies have found blood group A as a risk factor for keloid, this study found blood group O to be commoner among those with keloid. However, due to the small sample size involved in this blood group analysis, we are unable to draw a conclusion on this relationship. We recommend

a prospective study incorporating blood group as a variable to establish the above relationship.

Conclusion

Keloids are commoner in the younger age group who are also more likely to present earlier than the older population. Ear piercing, trauma, and shaving are the leading causes of keloid formation. These keloids are more frequently located in the earlobe, chest, and mons pubis, reflecting the leading causes. Patients with keloids in the trunk and lower limbs are more likely to present with symptoms whereas those with head and neck and upper limb keloids are more likely to present due to cosmetic reasons.

Declarations

Ethical Consideration: This study was conducted according to the ethical standards enshrined in the 1964 Declaration of Helsinki and the subsequent amendments. Data collection and management ensured confidentiality.

Authors' Contribution: Isamah CP (Conceptualization- Lead; Methodology- Lead; Validation- Equal; Investigation- Lead; Resources- Equal; Data curation- Equal; Writing (Original draft)- Lead; Writing (Review & Editing)- Lead). Akpomimie MO (Conceptualization- Equal; Methodology- Equal; Validation- Equal; Investigation- Equal; Resources- Equal; Data curation- Lead; Writing (Original draft)- Equal; Writing (Review & Editing)- Equal). Otene CI (Conceptualization- Equal; Methodology- Equal; Validation- Equal; Investigation- Equal; Resources- Lead; Data curation- Equal; Writing (Original draft)- Equal; Writing (Review & Editing)- Equal; Supervision- Lead; Project administration- Lead; Visualization- Lead)

Conflict of interest: The authors have no conflict of interest to declare.

Funding: The authors did not receive funding from any source that could have influenced the outcome of this study.

Acknowledgment: We acknowledge the surgical residents who contributed to the clinical management of these patients.

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