

Prevalence of Reactive Hyperplastic Gingival Lesions (RHLs) in a Nigerian Pediatric Population

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DOI: [10.36348/sjpm.2021.v06i09.005](https://doi.org/10.36348/sjpm.2021.v06i09.005)

| Received: 27.07.2021 | Accepted: 31.08.2021 | Published: 09.09.2021

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Abstract

Introduction: Reactive hyperplastic lesions which occur as a result of chronic irritation of the mucosa of the oral cavity are common lesions faced by dentists during routine examinations. **Aim:** The aim of this study was to assess the prevalence and sociodemographic distribution of reactive hyperplastic gingival lesions (RHLs) among the paediatric age group (0-18 years) over a period of 10 years (2010 to 2020). **Materials and Methods:** In this retrospective study, records procured from the archives of the Department of Oral Pathology and Oral Medicine, Faculty of Dentistry, Lagos State University College of Medicine, Nigeria over a period of 10 years (2010 to 2020) were reviewed. Information relating to the type of reactive lesion, age, gender and specific gingival location was extracted and recorded on data forms. Data was analysed using SPSS (version 21). **Results:** Paediatric RHLs constituted 13.5% of all lesions seen in childhood within the study period. They accounted for 14.4% of all RHLs in all ages. Pyogenic granuloma was the commonest RHL accounting for 57.9%, followed by peripheral ossifying fibroma (21.1%), least seen was peripheral giant cell granuloma. RHLs were most prevalent in the permanent dentition stage (73.7%). Female predominance was observed, with the upper and lower buccal gingiva presenting as the sites of predilection. 52.6% of lesions were sessile. Most RHLs were associated with non-mobile teeth and non-recurrence. **Conclusion:** The prevalence of RHLs in childhood was 13.5% with pyogenic granuloma being the most prevalent type. There was a predilection for permanent dentition age (13-18 years) and female gender though not significantly associated. RHLs occurred more frequently in the upper and lower buccal gingivae.

Keywords: Pyogenic granuloma, peripheral fibroma, peripheral giant cell granuloma, peripheral ossifying fibroma, reactive hyperplastic lesions.

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INTRODUCTION

Oral mucosa hyperplasias are tumour-like growths which develop as a result of persistent exposure of the oral mucosa to low-grade chronic trauma [1, 2]. Inflammation, which is the nonspecific immune response of the vascular tissue to any type of injury, goes hand in hand with the repair process (Robbins Pathology). However, continuous irritation and inflammation result in abnormal and exuberant response of the oral mucosa, resulting in a group of localised swellings of the mucosa referred to as Reactive Oral Mucosa Hyperplasias [3]. Many studies have looked at the prevalence of RHLs in the adult population, however very few of these really focused on the paediatric age group [3, 4].

Although there is no consensus on the upper limit of the paediatric age group, it is believed to be within a period from birth to 18 years [4-7]. This period is characterised by phases of active growth and development of the different structures of the oral cavity [7]. This is also a period when the primary teeth are formed, exfoliated and get replaced by the permanent dentition [7]. The dynamics of the developmental anatomy and physiology of children tend to influence the type of tumours and tumour-like lesions they present with. Studies have shown that most of these are inflammatory/reactive in nature [8, 9]. The dynamics of dental development in the paediatric age group will support exposure to localised chronic irritation by plaque and calculus, chronic cheek biting, sharp edges of teeth, crowding and food impaction which are identified local predisposing factors to RHLs

[8-10]. These local factors can however be aggravated by systemic factors such as; hormonal levels as observed in puberty [11-13]. The similar clinical appearances of RHLs may pose diagnostic difficulty to clinicians, definitive diagnosis can however be arrived at using their histopathologic features.

Reactive Hyperplastic Gingival Lesions (RHLs) clinically are painless, either pedunculated or sessile growths with colour ranging from light pink to red [14, 15]. The surface might be ulcerated or non-ulcerated. RHLs having evolved over the years have been classified and reclassified by different schools of thought [14, 15]. Clinically, these reactive lesions can be classified as traumatic fibroma (TF), pyogenic granuloma (PG), pregnancy tumour (PT), peripheral giant cell granuloma (PGCG) and Epulis fissuratum (EF) [1, 3]. Histologically, RHLs have been classified into pyogenic granuloma (PG), fibrous hyperplasia (FH), peripheral fibroma (PF), peripheral ossifying fibroma (POF), and peripheral giant cell granuloma (PGCG) [14, 15]. Histology of RHL reveals fibrous tissues with other histological components such as inflammatory infiltrate, multinucleated giant cells, calcified material, or small vessels hyperplasia [14, 16, 17].

The aim of this retrospective study was to determine the relative prevalence and distribution of the oral mucosa reactive lesions among the paediatric population, referred to the Department of Oral Pathology and Oral Medicine, Lagos State University College of Medicine, Nigeria.

METHODOLOGY

This study is a cross-sectional retrospective study, which extracted biopsy records of RHLs seen in paediatric patients between the ages of 0 and 18 years, within a period of 10 years at the Oral Pathology laboratory of the Department of Oral Pathology and Oral Medicine, Lagos State University College of Medicine, Ikeja, Nigeria. Biopsy record books of the

Oral pathology laboratory within the 10-year period were reviewed. All cases of RHL were considered for analysis of socio-demographic characteristics and clinico-pathological features. Biopsy reports of all patients between 0 and 18 years with histological diagnosis of RHL were included. Data on age, sex, site and histopathological diagnosis of each case were collected. The patients were divided into three age groups; group 1 (0-5 years), group 2 (6-12 years) and group 3 (13-18 years). The study population was categorized into these 3 age groups based on their dentition period; primary dentition period (0-5 years old), mixed dentition period (6-12 years old) and, permanent dentition period (13-18 years old). All data were retrieved and tabulated in a Microsoft Excel (2016) file for epidemiological description. The data were analyzed using SPSS version 21 (Armonk, NY: IBM Corp). Descriptive statistical analysis carried out was for socio-demographic variables such as age, gender, location of tumour and incidences of the lesions. The absolute and relative frequencies were expressed as percentages. Means and standard deviations were used for continuous variables while proportions and tables were used for categorical variables, analysis of each diagnosis entailed: the number of samples, male: female ratio, age range, mean age and standard deviation.

RESULTS

Frequency distribution of reactive oral mucosa hyperplasias

RHLs constituted 19 cases (13.5 %) of the 141 lesions seen in childhood during this study period. Lesions were classified into pyogenic granuloma, peripheral ossifying fibroma, peripheral giant cell granuloma and fibrous hyperplasia. Most occurring were 3 the pyogenic granulomas constituting 11 cases (57.9%) of RHLs, followed by peripheral ossifying fibroma, 4 cases (21.1%). Least seen were peripheral giant cell granuloma and fibroepithelial hyperplasia with a single case each (5.3%). Figure 1

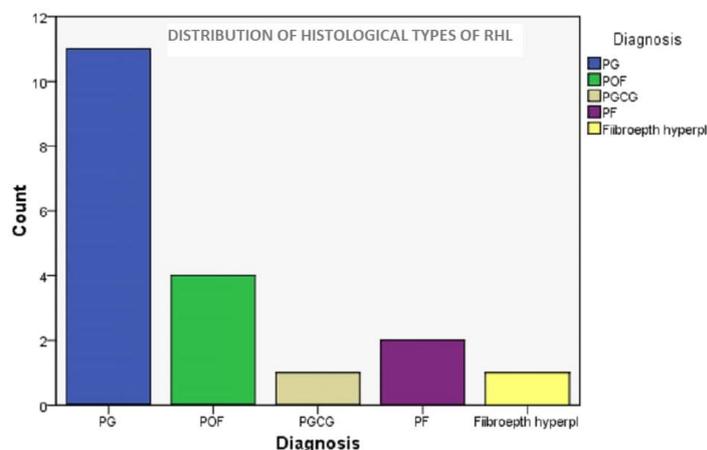


Fig-1: Frequency of rhl

Age, gender and site distribution of reactive oral mucosa hyperplasias

RHLs were seen within the age range of 3-19 years with a mean of 14.1±3.9 years. Most lesions were observed within the permanent dentition/ 13-18-year age group at 73.7%, followed by the mixed dentition stage/6-12-year age group constituting 21.1%. Least, which is a single case, was seen in the deciduous dentition stage, 5.3%. There was no statistically significant relationship between age group and RHL.

Upper and lower buccal gingivae were the most frequent sites accounting for 31.6% each of all sites followed by the palate at 26.3% and least was the lingual gingiva.

42.1% of RHLs were associated with mobile teeth, with only 1 case of recurrence recorded Table 1.

Table-1: Summary of age, gender, site distributions and clinical features

Variables	Frequency	Percentage (%)
AGE GROUP		
0-5	1	5.3
6 –12	4	21.1
13 – 18	14	73.7
GENDER		
Male	8	42.1
Female	11	57.9
ANATOMICAL SIT		
Lower buccal gingiva	6	31.6
Lingual gingiva	2	10.5
Upper buccal gingiva	6	31.6
Palate	5	26.3
HISTOLOGIC DIAGNOSIS		
Pyogenic granuloma	11	57.9
Peripheral fibroma	2	10.5
Peripheral ossifying fibroma	4	21.1
Peripheral giant cell granuloma	1	5.3
Fbiro-epithelial hyperplasia	1	5.3
TOOTH MOBILITY		
Mobile tooth	8	42.1
Nil mobile tooth	11	57.9
LESION RECURRENCE		
Recurrent	1	5.3
Not Recurrent	18	94.7

Age group distribution of rhls

13-18-year age group had the highest occurrence of all lesions, 8 cases (72.7%) of PG were seen in the permanent dentition stage, while the remaining 3 cases (27.2%) were recorded in the mixed

dentition stage. The only cases of peripheral giant cell granuloma and fibroepithelial hyperplasia seen were also recorded in the permanent dentition stage. Only 1 case of peripheral fibroma was observed as the only lesion in the deciduous dentition. Table 2.

Table-2: Age group distribution of rhl

Age Group (Years)	PG (%)	N	PF N (%)	POF (%)	N	PGCG N (%)	FH N (%)	Frequency N (%)
0-5	0 (0.0)		1 (100.0)	0 (0.0)		0 (0.0)	0 (0.0)	1 (5.3)
6-13	3 (75.0)		0 (0.0)	1 (25.0)		0 (0.0)	0 (0.0)	4(21.1)
13-18	8 (57.1)		1 (7.1)	3 (21.4)		1 (7.1)	1 (7.1)	14 (73.7)
Total	11 (57.9)		2 (10.5)	4 (21.1)		1 (5.3)	1 (5.3)	19 (100)

Likelihood ratio $\chi^2 = 6.742$ Degree of freedom = 8 p = 0.565

Gender distribution of RHLs

Females accounted for 11 (57.9%) of RHLs in the study population, while 8 (42.1%) were males, a

Male: Female ratio of 0.7:1 was recorded. There was no statistically significant difference in the occurrence of RHLs among genders. Most lesions occurred more

commonly in females, except for POF and PF, where equal gender predilections were observed Table 3.

Table-3: Gender distribution of rhls

Histologic Type of RHL	Male N (%)	Female N (%)	Male:Female Ratio	Total N (%)
Pyogenic Granuloma	5 (45.5)	6 (55.5)	0.8:1	11 (57.9)
Peripheral Fibroma	1 (50.0)	1 (50.0)	1:1	2(10.5)
Fibroepithelial Hyperplasia	0	1 (100.0)	0:1	1 (5.3)
Peripheral Ossifying Fibroma	2 (50.0)	2 (50.0)	1:1	4 (21.1)
Peripheral Giant Cell Granuloma	0	1 (100.0)	0:1	1 (5.3)
Total	8 (42.1)	11(57.9)	0.7:1	19

Likelihood ratio $\chi^2 = 2.388$ Degree of freedom = 4 p = 0.665

APPEARANCE OF RHL

52.6 of lesions were sessile, while 47.4% were pedunculated. Figure 2

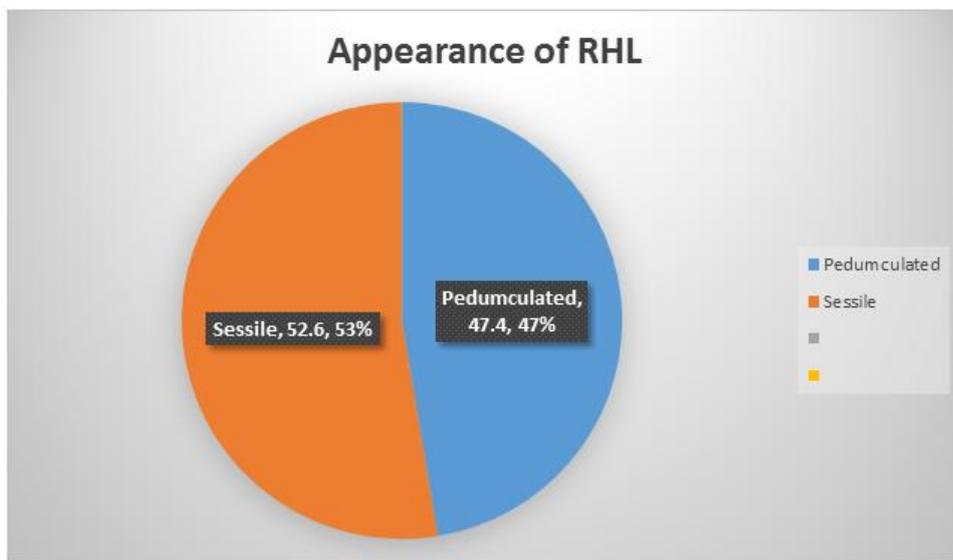
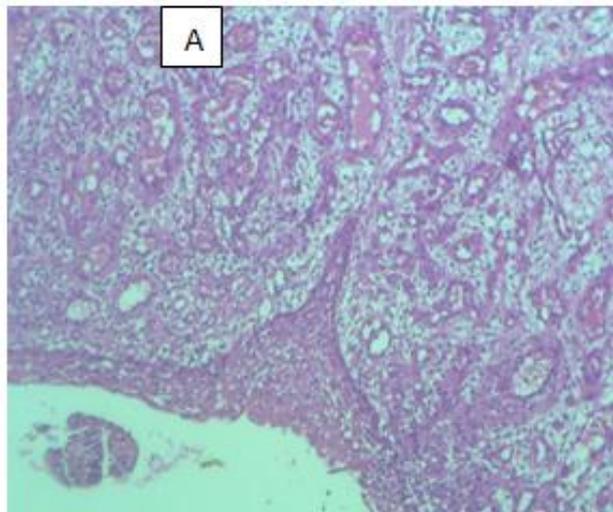
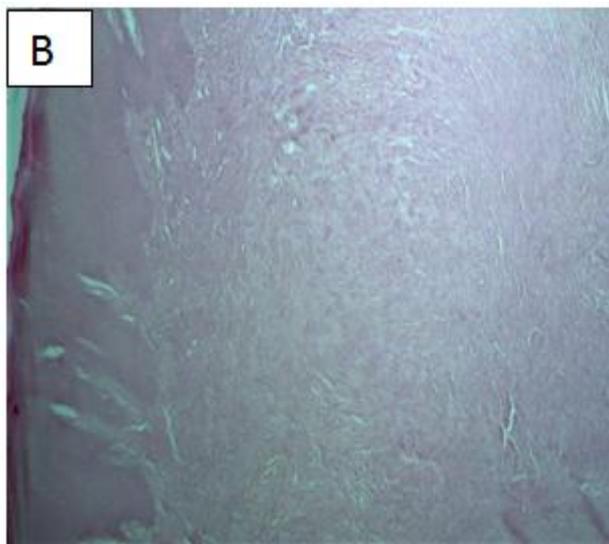


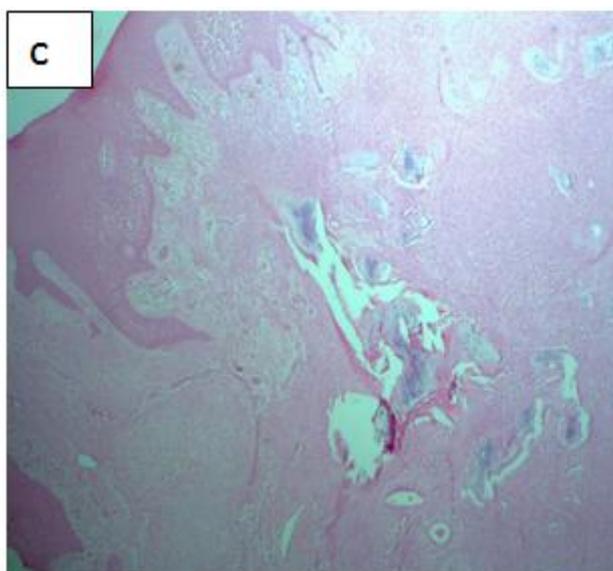
Fig-2: Appearance of Rhl



Photomicrographs of pyogenic granuloma showing an eroded surface epithelium, within the underlying cellular fibrous connective tissue are numerous engorged endothelial lined vascular channels and chronic inflammatory cellular influx. Magnification x40 (H&E))



Photomicrograph of peripheral fibroma showing sparsely cellular, highly collagenised, dense fibrous connective tissue underlying a keratinised stratified squamous epithelium Magnifications x40 (H&E)



Photomicrographs of peripheral ossifying fibroma demonstrated collagenised connective tissue stroma within which are calcified osseous deposits. Magnifications x40 (H&E)

Fig-3: Photomicrographs

DISCUSSION

RHLs are a group of reactive lesions which occur in the oral cavity due to the exaggerated response of the connective tissue of the oral mucosa to chronic irritations and insults [1, 3]. This abnormal response has been proven to be aggravated by systemic factors, such as, hormonal imbalance [11-13]. Kfir *et al.* classified them into pyogenic granuloma, peripheral ossifying fibroma, peripheral giant cell granuloma and fibrous hyperplasia [14]. Numerous studies have in the past focused on RHLs in the adult population with paucity of literature on what obtains within the paediatric age group [3, 15]. Findings of this study have however provided good insight into the prevalence of RHLs among the paediatric population. RHLs constituted

13.5% (19 cases) of the 141 lesions seen in childhood, similar to the study by Lima *et al.* [6] who reported a prevalence of 11% in a Brazillian paediatric population. A higher value (22%) was recorded in an African study by Soyele *et al.* [16] who conducted their study in an adult sub Saharan African population with less oral hygiene awareness. Much lower values have also been recorded, 6.7% was observed by da Silva *et al.* [3] in another Brazillian paediatric population, Yanez *et al.* [17] and Effiom *et al.* [18] reported 4.9% and 5.6% respectively in adult populations. The marked variability observed in the prevalences across populations can be attributed to age, oral hygiene awareness, practices, lifestyle, differential diets and possible genetic variability across the study

populations. Paediatric RHLs constituted 19 cases (14.4%) of the 132 cases of RHL seen in all age groups; this could not be compared with other studies in our environment due to marked paucity of literature on the paediatric population.

Five types of RHLs namely: pyogenic granuloma (PG), peripheral fibroma (PF), peripheral ossifying fibroma (POF), fibroepithelial hyperplasia (FH) and peripheral giant cell granuloma (PGCG) were encountered in this study similar to many previously documented studies [3, 9, 10]. The most prevalent lesion observed was pyogenic granuloma, 11 cases constituting 57.9% of RHLs seen, remotely followed by peripheral ossifying fibroma; 4 cases (21.1%), this is quite similar to findings by Effiom *et al.* who recorded 57% and 20.4% for Pyogenic granuloma and Peripheral ossifying fibroma in the adult population. Buchner *et al.* [15] in a large series conducted in Israel however, reported their highest prevalence with peripheral ossifying fibroma (33%). A single case of peripheral giant cell granuloma, (5.3%) was recorded in our study making it the least observed RHL with fibro-epithelial hyperplasia, this is at variance with the findings of da Silva *et al.* [3] in their study where peripheral giant cell granuloma was the second most prevalent lesion constituting 24.4% of their study population.

Age distribution of RHLs in our study revealed a mean age of 14.1 years; lesions were seen between 3 and 18 years. Prevalence of RHLs was observed to be in an ascending order from 0-5-year age group with prevalence of 5.3% to 13-19-year group with 73.3%, similar to the observation in previous Nigerian and Brazilian studies by Soyele *et al.* [11] and daSilva *et al.* [3] who observed similar trends. Majority of RHLs were observed in the permanent dentition (13-18 -year age group), 14 cases (73.3%), comparable to daSilva *et al.*'s observation, whose highest prevalence was seen in the same age group at a value of 53% [3]. Permanent dentition stage coincides with the period when pubertal hormones come to play; this can explain the high prevalence in this age group. 0-6 year age group recorded least occurrence of RHLs in this study and the previous study by DaSilva *et al.* [3]. Further comparison of data was greatly hampered by the marked paucity of data within the paediatric population.

Female predilection of RHLs observed in this study is similar to previous observations by earlier studies, however there was no statistically significant relationship between gender and RHL [3, 4, 10, 12]. This has been explained by the attendant role of hormones in the aetio-pathogenesis of gingival pathosis as proven and discussed in various scientific literatures [16-19].

Although there was no statistically significant relationship between lesions and site, RHLs were

observed more commonly in the maxilla (57.9%), while 42.1% was observed in the mandible. This finding is at variance with the study by daSilva *et al.* [3] who recorded slightly higher prevalence in the mandible than the maxilla, but similar to the observation of Soyele *et al.* [20] among the adult population 52.6% of RHLs in the present study presented as sessile lesions, 42.1% were associated with tooth mobility, while 5.3% (1 case) was a recurring lesion.

CONCLUSION

The prevalence of RHLs in childhood was 13.5% with pyogenic granuloma been the most prevalent type. There was a predilection for permanent dentition age (13-18years) and female gender though not significantly associated. RHLs occurred more frequently in the upper and lower buccal gingiva.

RHLs are reactive lesions with good prognosis, however detailed knowledge types, frequency and distribution of this group of lesions is important to be able to differentiate between them and more sinister lesions which may also present in the oral cavity. This is especially of greater importance in resource limited settings like ours, where appropriate investigations may not be readily available.

One limitation of this study is the marked dearth of literature in the paediatric age for comparison, pointing to the relative lack of attention put on pathologies affecting this age group. We recommend larger series and multicentre studies, which will help to pool more representative data to address the paediatric population.

Conflict of interest

The Authors declare that they have no conflict of interest.

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