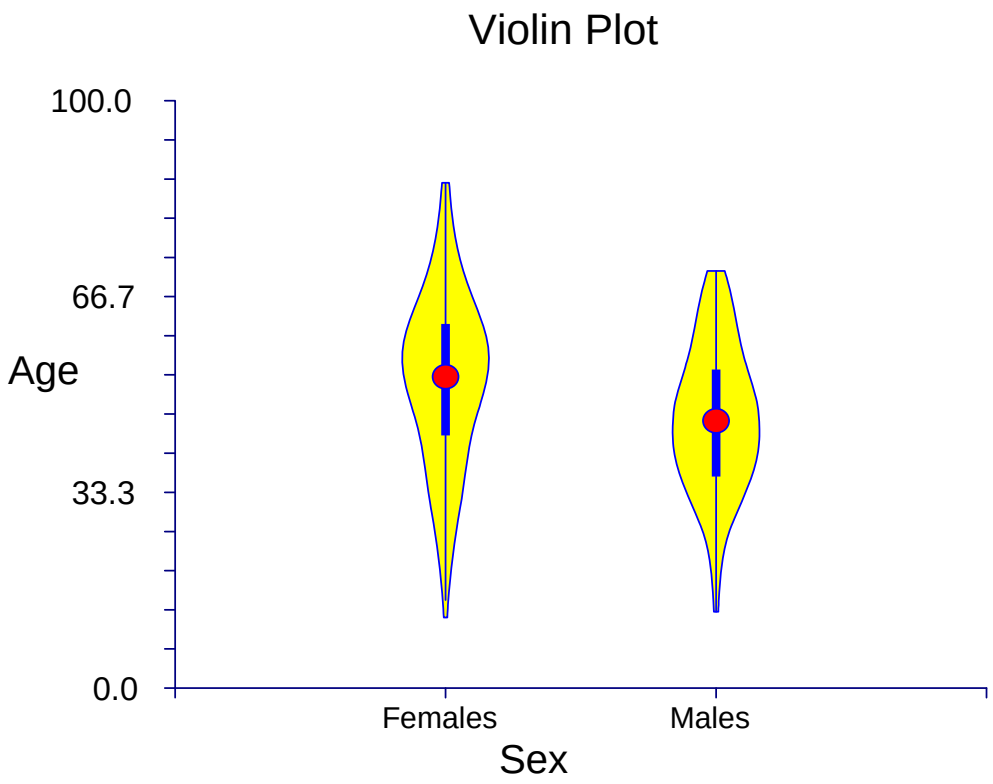

Figure 3.2:

Side-by-side violin plots of the age of the two genders
(Females: Males = 150:51).

The red dot in the “middle” indicates the median of the age distribution. The thick blue bar to the bottom indicates the first quartile and the thick blue bar to the top indicates the third quartile. The distance from the bottom to the top of the thick blue line depicts the inter-quartile range.

The age distribution of both females and males are symmetrical about the median, except to a lesser extent for the females, which had a long tail toward the lower age groups.

Table 3.9

The intra-oral distribution of *oral lichen planus* in the complete sample

Intra-oral location	
Single sites	
Buccal mucosa	134
Gingiva	34
Labial mucosa	2
Palate	1
Tongue	21
Retromolar area	2
Not specified	28
Multiple sites	
Bilateral Buccal mucosa	14
Buccal mucosa and gingival	6
Buccal and labial mucosa	1
Buccal mucosa and tongue	6
Total	249

Table 3.9 shows the 249 diagnosed cases of *oral lichen planus,* 194 lesions were at a single intra-oral site. The buccal mucosa was affected in 134 of those single sites; the gingiva at 34; 2 lesions were located at the labial mucosa; 1 was situated on the palate, 21 on the tongue and 2 in the retromolar area. The location of twenty-eight (28) lesions was not recorded on the pathology reports. Of the 249 cases, 27 were located at multiple intra-oral sites. The buccal mucosa was affected bilaterally in 14 cases. Six lesions were located on both the buccal mucosa and the gingival; 6 lesions were on the buccal mucosa and the tongue. One case of lichen planus was located on both the buccal and labial mucosa. Eighty-five (85%) percent of the lesions in the females were situated on the gingiva, while the lesions at other sites in females was less than 75%.

Chapter Four

Discussion and Conclusions

4.1 Discussion

From the retrievable records from three diagnostic centres within the Western Cape, two hundred and forty nine cases of oral lichen planus were diagnosed over a 34 year (1974-2008) period. The number of *oral lichen planus* cases was low compared to the overall number of biopsy reports over the same period of time which was estimated to be from 20000 to 25000. These estimations could not be fully verified for all sites and were estimated from available records at Tygerberg Oral Health Centre. This suggested that the proportion percentage of biopsied and diagnosed cases of oral lichen planus for the province as a whole to be even lower.

The pathognomonic clinical features of reticular lichen planus may lead some clinicians to define a diagnosis on clinical manifestations only and thus not perform a biopsy. Furthermore, information regarding cases with a clinical diagnosis of *oral lichen planus* but a different definitive histological diagnosis was not available.

McCartan and Healy (2008) reviewed and critiqued studies that have been conducted on the prevalence of oral lichen planus. Several of the studies that were reviewed had not included a biopsy of oral lichen planus and the diagnosis was made on a clinical basis only. This study in the Western Cape does not truly represent all cases of *oral lichen planus* diagnosed over the 34 year period (1974-2008) as there may have been clinically diagnosed cases that were not biopsied. The McCartan and Healy (2008) review highlights that clinical diagnosis alone is not reliable and histological diagnosis is needed to

arrive at a definitive diagnosis. There is also variability within the different studies on the diagnostic criteria used for both clinical and histological diagnosis of oral lichen planus. Furthermore, this study based on histological diagnosis aimed at overcoming this variability by defining the definitive inclusion criteria.

The description of ethnicity within the sample was identified. It was clear that there was lack of uniformity in the reporting of the ethnic origins of patients. One patient was reported as “non-white”, some others as “other” and many had no report on the ethnic origin of the patients. Due to the unknown ethnic origin of those not reported, and the ambiguity of the terms “non-white and “other” these particular patients had to be excluded from further statistical analysis. This resulted in the omission of 48 out of 249 cases of oral lichen planus. The political history of South Africa during the Apartheid era, suggests that the matter of ethnicity may have been too sensitive for some clinicians to ask patients about or to report on.

The 201 cases of known ethnicity were then divided into females and males. Within the female group the majority of females were White, 128 (85.3%) as apposed to 17 (11.3%) Coloured females and 5 (3.3%) Indian females. It was interesting to note that no African females were affected within this sample. The proportion of males within the different ethnic groups was generally lower than the females, except in those who were African; 2 African males were affected and no African females. Furthermore, White males were in the majority, 35 (71.4%) and there were 10 (20.4%) Coloured males and only 4 (8.2%) Indian males.

When one looks at the population distribution within South Africa, it is clear that individuals of African origin are within an overwhelming majority. African individuals, according to the 2001 Census within South Africa as a whole make up 79% of the population, White individuals make up 9.6%, Coloureds 8.9% and Indian individuals, 2.5 % of the population. The expectation of a disease trend across the different population groups in any given sample would then be expected to follow the same percentage distribution, namely for

the given sample the expectation would have been that 159 individuals should have been African, 19 White, 18 Coloured and 5 Indian (Table 3.5). The Chi squared test (Test statistic= 1235.73) performed on this analysis resulted in a difference that was highly significant due to the difference in this expectation and the actual finding within this sample group.

When the same population statistics are analysed for the population within the Western Cape, the outcome is different. Within the Western Cape it has been established, according to census 2001, that the population proportion is different to that of the rest of South Africa. Namely, the Coloured population is in the majority at 53, 9%, followed by the African population at 26, 7%, the White population at 18, 4% and the Indian population at 1,0%. When one then uses these figures as a basis of expectation for this sample from within the Western Cape, within the sample of 201, it would be expected that 108 individuals with oral lichen planus should have been Coloured, 54, African, 37, White and 2 Indian (Table 3.7). The observed numbers of affected individuals was however very different to that which was expected. A Chi squared test was once again applied, and the outcome (564.32) was less significant in the difference that was observed than that which was expected. The distributional fit for oral lichen planus according to the population groups or ethnic origin was thus better for the Western Cape than for South Africa, yet remains a skewed distribution due to the biased sample.

Epidemiological studies conducted on *oral lichen planus* largely focus on the distribution of this disorder by sex only, few studies mention or define this disorder by ethnicity. When however, the ethnic distribution of those affected with *oral lichen planus* was reviewed in the literature, it became clear that *oral lichen planus* is a rarity in African individuals (Daramola *et al;* 2003). As early as 1985, it was recognised that the prevalence in African individuals is low, as Silverman and Lozada-Nur had 1% of their study population being Black of African decent, whereas 94% was White. In 2006, Ingafou et al established a prevalence among black (African and Carribean decent) individuals to be so low that in addition to other ethnic backgrounds such as Mediterranean and Chinese this group who made up 8% of the study population as opposed to

63,6% that were White. The ethnic or population groups within the South African context are very different to that from the studies referred to above. An earlier South African study by Dreyer *et al*, 1982, reported on 33 cases of *oral lichen planus* and found that 94% of that study population was White. However, just like similarities could not be drawn from studies within other countries, the particular study was conducted at a centre that serviced a mainly White population during that period of time as a result of the Apartheid system.

As previously highlighted in the limitations of this study, a scientific opinion on sex and age for the general population cannot be made from the data presented within this sample. The sex and age distribution within this sample are however presented for discussion below but is should be stressed that the discussion only pertains to this limited sample.

Oral lichen planus within this sample followed a female predilection. The sample expressed a female to male ratio of approximately 3:1. Within an ideal sample to determine true disease prevalence one would study a sample that has an equal number of males and females. The Chi squared test of the observed gender distribution (3:1) and the theoretical distribution (50:50) were extremely different and supported the notion that *oral lichen planus* followed a female predilection. This may be a verification of the fact that *oral lichen planus* is an oral disorder that may be patient reported or discovered by a clinician on routine dental examinations. The gender distribution of studies conducted worldwide report a female predilection; however some studies described as true population studies have reported prevalence rates to be nearly the same in females and males (McCartan & Healy, 2008). These studies were conducted in earlier years when the contention of lichenoid reactions were not yet generally recognised, furthermore there is no uniformity of diagnostic criteria used to arrive at a definitive diagnosis of *oral lichen planus.* The present study aimed to overcome this by only including those cases with a known definitive histological diagnosis.

The age range for the Western Cape sample was from 12 to 86 years. Incomplete recording of variables resulted in 6.4% of the sample with an unknown age. Descriptive statistics were applied to known ages of participants, stratified by gender. The median age of the females was six and a half years older than the average age of all the females (median= 59, average= 52.34). The median and average age of the male participants were however approximately the same (median= 45.5, average= 45.73). Analysing the values of the averages and medians shows that the average and median age of onset for the females was older than that of the males. A Wilcoxon test showed that this difference in age between the females and males was significant (p<0.001). Side by side violin plots (Figure 3.2) illustrates the age ranges for females and males within this sample. The inter-quartile range for the males was larger than that of the females. The males were younger at the time of presentation of *oral lichen planus*. The maximum age of the males was 15 years younger than that of the females.

The frequency table (Table 3.9) of the intra-oral distribution of *oral lichen planus* shows that the buccal mucosa was most frequently affected. This finding is in keeping with that of other studies (Eisen; 2002; Eisen *et al;* 2005; Scully & Carrozzo; 2008). The occurrence of *oral lichen planus* on the gingiva manifested clinically as desquamative gingivitis and this was seen more frequently in females (85%) than the other intra-oral sites.

4.2. Conclusions

There is a need for uniformity of record taking of patients who undergo intra-oral biopsies. All patient variables such as sex, ethnic origin and age need to be systematically recorded. It can be concluded that this sample is biased and no definitive conclusions regarding patient demographics of *oral lichen planus* can be extrapolated from this sample as a representation of the general population of the Western Cape or South Africa. Within the confines of these limitations, as previously highlighted, *oral lichen planus* was found to occur in individuals of all ethnic backgrounds. The latter statement remains

contentious within this particular sample. The inclusion of pre-1994 records has skewed the sample to a predominantly White distribution; however the inclusion was mandatory to provide sufficient data for statistical analysis. Even though the population demographics for the Western Cape had changed since 1994 and the influx of patients at tertiary dental institutions has also changed during this period of time, no post 1994 records included individuals of African origin. This may be due to lack of adequate record taking by attending clinicians or due to the fact that variants of *oral lichen planus* are asymptomatic and thus treatment for this disorder may not be sought. Within suburbs that are largely populated by African individuals there are community clinics equipped to treat dental pain and sepsis, thus *oral lichen planus* may be going undiagnosed in these areas, especially the asymptomatic variant. Symptomatic patients would still however need to be referred to the tertiary dental teaching institutions where biopsies would have been taken. The fact that no record of these biopsies were found for these individuals within the archives, may support the notion that *oral lichen planus* is a rarity in African individuals but the biased sample presented provides no definitive conclusion in this regard. Optimal population based studies within communities will overcome this problem.

The female to male ratio was 3:1. The average age of onset of *oral lichen planus* was older for females (52.34) than for males (45.73). The intra-oral distribution of *oral lichen planus* was most frequently found on the buccal mucosa, followed by gingival lesions. Considerably more females had gingival lesions.

Future study in this area is warranted and suggestions follow;

1. This study should be carried out in other provinces within South Africa that are predominantly African in its population breakdown. This will give a true reflection if *oral lichen planus* is a feature in this population group.
2. Ideally community, rather than treatment centre based studies should be conducted in this regard for a true epidemiological reflection of *oral*

lichen planus. Clinical diagnoses in this setting should however be verified by a histological diagnosis.

3. Protocols should be constituted so that patients who present with *oral lichen planus* can be included in prospective studies and the course of their disease can be monitored, thus shedding light on other topical issues that abound this disease process, such as its malignant potential and the association it may have with Hepatitis C infection.

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