



Prospective Comparative Study of the Influence of Gender on the Clinical Profile and Quality of Life in Post Adolescent Acne

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Authors' contributions

This work was carried out in collaboration between all authors. Author ELA designed the study, wrote the protocol and wrote the first draft of the manuscript. Authors RIO and MOCA recruited and clinically evaluated the patients managed the documentation of the study. All authors read and approved the final manuscript.

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ABSTRACT

Background: A lot has been written on post adolescent acne and its effect on quality of life in women but not in men. The differences if any between post adolescent acne in men and women is not known. The aim of this study is to compare the clinical features and quality of life affectation of post adolescent acne in males and females.

Patients and Methods: This prospective cross-sectional study was conducted over one year on 77 patients who had post adolescent acne. Sociodemographic data was documented. They were clinically evaluated for lesion type and acne severity was graded. Quality of life impairment was documented using the Cardiff Acne Disability Index (CADI) instrument. Data was analyzed using the SPSS version 22. Level of significance of all statistical tests was set at $P < 0.05$.

Results: There were 77 post adolescent acne patients made up of 27.3% males and 72.7% females. Prevalence of acne was 15.5% in males and 19.3% in females. Median age was 28 years in males and 31 years in females. Females had mixed lesions while males had non-inflammatory

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lesions. Quality of life was impaired in all the participants irrespective of gender. Mean Cardiff acne disability index in males was 6.6 ± 3.2 and 6.5 ± 3.8 in females. In males, only the severity of acne impaired quality of life while in females, quality of life was impaired by severity of acne, age at presentation, presence of acne scar and presence of post inflammatory hyperpigmentation.

Conclusion: Post adolescent acne in males and females differ in prevalence, family history, lesion type, type of acne, severity and quality of life affectation and the factors that negatively impact quality of life.

Keywords: Post adolescent acne; gender; quality of life; acne scar.

1. INTRODUCTION

Post adolescent acne also known as adult onset acne is becoming a common presentation in dermatology clinics especially in females in whom a prevalence of up to 40% is reported [1-3]. Most studies of acne have been in adolescents and adult females [4-7]. Acne in males and specifically in adult males is not readily studied nor the differences between adult male and adult female acne [2,5,6,8]. In adult females acne affects mainly the face. Also in females, the cheeks and chin are more affected [3,5,9,10]. The only study thus far of the clinical profile of acne in males was of adolescents in Brazil and they had the whole face and back as the main areas affected by acne [8].

Post adolescent acne is defined as presence of acne beyond the age of 25 years irrespective of age at onset of acne [11,12]. There are two types of this acne; late onset and persistent acne [3]. Acne is said to be persistent if acne continues from adolescence into adulthood and late onset if acne occurs for the first time after age 21-25 years [3]. In adults, prevalence of acne is documented to be 12-14% in females and 3% in males [1]. Females are more likely than males to develop acne and the prevalence of adult female acne decreases after age 45 years [1,2,10,13, 14].

Following a community based comparative study of acne prevalence in 1013 adult males and females aged 20 years and above, females were found to have more acne than males irrespective of age [2]. In participants aged 20-29 years, prevalence of acne was 50.9% in females and 42.5% in males, in those aged 30-39 years, prevalence of acne was 35% in females and 20% in males [2]. This study also revealed a decreased prevalence of acne with increasing age in adult females, prevalence being 50.9% at age 20-29 years and 15.3% at age 50 and above [2].

In adult females, scarring occurs following acne especially in those who have inflammatory acne [15]. Post-inflammatory hyperpigmentation (acne scar) is observed in 11% to 49% of adult female acne patients [3,16]. There is no study of adult male acne but a study on male adolescent acne showed scarring in 21% [8].

Acne vulgaris is known to adversely affect all aspects of quality of life of adult females [10,15,17,18]. Acne results in decreased social functioning, negative emotions about having to be treated for acne and low self-esteem in adult females [18]. The impact of acne on QOL in adult females is more than it is in adolescents who have acne [19]. In adult females, age, age at onset of acne, BMI do not affect QOL [17]. Treatment of acne results in improvement of QOL [17]. There are currently no studies on QOL of adult male acne patients.

Comparative studies of acne in males and females are rare and even rarer are post adolescent acne studies. Differences in lesion type, type of acne, anatomical site of acne, scarring and type of scars between males and females with post adolescent are not known. Also, it is not known if there is any gender based difference in QOL impairment or if there are any differences in the clinical or sociodemographic factors which impair QOL. The aim of this study is to document, compare and determine if there are any differences in clinical features and QOL between post adolescent males and females who have acne.

2. MATERIALS PATIENTS AND METHODS

This prospective, cross sectional descriptive study of 77 adults aged 25 years and above who had acne was conducted over a one year period at the skin clinic of the Lagos state university teaching hospital following ethical committee approval. A study proforma designed for the study was used in the documentation of sociodemographic and clinical findings. The

proforma had questions on gender, age, age at onset, family history, level of education, marital status, duration of acne, history of teenage acne, type of acne (persistent or late onset). Clinical data included anatomical location of acne, type of acne lesions, severity of acne, acne scar and type of acne scar. All patients were clinically examined by a board certified dermatologist. Severity of acne in this study was graded as mild, moderate and severe using the Combined Acne Severity Scale (CASS) [20].

Assessment of QOL was done using the Cardiff Acne Disability Index (CADi) [21]. The CADi has five (5) questions with four responses. The five questions relate to feelings of aggression, frustration, interference with social life, avoidance of public changing facilities and appearance of the skin (in the month prior to clinic attendance) and an indication of how bad the acne is now. Scores range from 0-3 per question. This leads to scores of 0-15, with high scores inferring poor QOL and low scores little or no impairment of QOL [22].

The Statistical Package for Social Sciences (SPSS) IBM version 22 was used to enter and analyze data. Histogram plot was used to assess if numerical variables (including quality of life scores) were normally distributed. Median of two or more independent groups were compared using Mann whitney U or Kruscal wallis test while Chi squared test was used to compare categorical variables. For all statistical tests, P value of <0.05 was adjudged to be significant. Microsoft excel was used to draw charts.

3. RESULTS

A total of 77 adults aged 25 and above were attended to for acne; 27.3% males and 72.7% females (M:F,1:2). During the study period 290 new adult female patients attended the clinic out of which 56 had acne giving a female acne prevalence of 19.3%. In the same period, 135 new adult male patients were seen, 21 had acne giving a male acne prevalence of 15.5%. Median age was 31 years in females (age range 25-67) and 28 years in males (age range 25-47). In males, acne was more prevalent in those aged 25-30 years

while in females, acne was more prevalent in those aged 30-39 years. Unlike in females, acne was not present in males after age 50 years.

Irrespective of gender, the predominant level of education was tertiary. In males, the level of education was tertiary in 71.4% and primary or secondary in 28.6%. In females, the level of education was tertiary in 87.4% and primary or secondary in 12.5%. There was no statistical difference in level of education with $P=0.094$. Marital status was respectively single and married in 66.7% and 33.3% of males. In females, 66.1% were single and 33.9% were married. There was no statistical difference in marital status between the genders, $P=0.961$. Onset of acne was <20 years in both genders and decreased with increase in age. No male had onset of acne after 40 years of age unlike females. Females significantly had more family history of acne. Males had more of late onset acne (52.4%) while females had more of persistent acne (58.9%). Severity of acne was mostly moderate in both genders. Almost all the patients thought that acne could be cured and there was no difference in this thinking between males and females, $P=0.509$; 90.5% of males thought so and 94.5% of females thought so. The practice of bursting pimples was recorded more in males than in females; in 85.7% and in 78.6% respectively ($P=0.745$). Females had more family history of acne. The type of acne was persistent in females and late onset in males Table 1.

Clinically, severity of acne was moderate in 38.1% of males and in 44.6% of females with no statistical difference, $P=0.448$. There was a statistical difference in lesion type, females had more of mixed lesions while males had non-inflammatory lesions, $P=0.001$. Although not statistically significant, site of acne is mainly facial in females and males tend to have more truncal involvement, $P=0.091$. Scarring was present in most of the patients irrespective of gender with no statistical difference, $P=0.465$. The main type of acne scar was PIH and there was no statistical difference between males and females, $P=0.227$ Table 2.

Table 1. History and sociodemographic parameters of patients

Variable	Male n=21 (%)	Female n=56 (%)	Test	P
Age group (years)				
< 30	12 (57.1)	21 (37.5)	1.251**	0.211
30-39	7 (33.3)	24 (42.9)		
40-49	2 (9.5)	9 (16.1)		
≥ 50	0 (0.0)	2 (3.6)		
Age range	25-47	25-67		
Median (IQR)	28.0 (26.0, 36.0)	31.0 (27.0, 38.5)		
Age at onset (years)				
<20	8 (38.1)	30 (53.6)	1.123**	0.262
20-29	9 (42.9)	16 (28.6)		
30-39	4 (19.0)	5 (8.9)		
≥ 40	0 (0.0)	5 (8.9)		
Median (IQR)	21.0 (18.5, 25.0)	19.0 (14.3, 26.0)		
Family history of acne				
Yes	7 (33.3)	29 (51.8)	3.830*	0.050
No	11 (52.4)	15 (26.8)		
I don't know	3 (14.3)	12 (21.6)		
Duration of facial acne (years)				
< 1	3 (14.3)	8 (14.3)	0.000*	1.000
≥ 1	18 (85.7)	48 (85.7)		
Type of pimples				
Persistent	10 (47.6)	33 (58.9)	0.792	0.373
Late Onset	11 (52.4)	23 (41.1)		

NB # = Not part of the analysis

** = Mann Whitney U test

= Chi squared test

Quality of life was impaired in all the participants irrespective of gender. Mean CADL in males was 6.6 ± 3.2 and 6.5 ± 3.8 in females (P= 0.974). Most males had a moderate QOL impairment

while females had an almost equal distribution between mild and moderate impairment. Comparatively more females had a severe QOL impairment Fig. 1.

Table 2. Clinical features of acne

Variable	Male n=21 (%)	Female n= 56 (%)	x2	P
Anatomical site				
Face only	15 (71.4)	45 (80.4)	2.857	0.091
Face and other sites	9 (28.6)	11 (19.6)		
Type of lesion				
Inflammatory	7 (33.3)	3 (5.4)	21.834	<0.001
Non-inflammatory	14 (66.7)	24 (42.9)		
Mixed	0 (0.0)	29 (51.8)		
Scarring				
Yes	17(81.0)	49(87.5)	0.535	0.465
No	4(19.0)	7(12.5)		
Type of scars				
Ice pick only	n = 17 2 (11.8)	n = 49 1 (2.0)	2.962	0.227
PIH only	9 (52.9)	32 (65.3)		
Ice picks and PIH	6 (35.3)	16 (32.7)		
Severity of acne				
Mild	7 (33.3)	11 (19.6)	1.609	0.448
Moderate	8 (38.1)	25 (44.6)		
Severe	6 (28.6)	20 (35.7)		

Table 3. Comparison of factors associated with QOL impairment

Variable	n	Male Quality of life Median (IQR)	P	n	Female Quality of life Median (IQR)	P
Age group						
<30	12	6.5 (4.0, 9.0)	0.188	21	8.0 (4.5, 12.0)	0.038
30-39	7	6.0 (2.0, 8.0)		24	5.5 (3.3, 8.8)	
≥ 40	2	10 (8.5)		11	4.0 (2.0, 5.0)	
Anatomical site						
Face only	16	7.0 (4.0, 9.0)	0.159	45	6.0 (4.0, 10.0)	0.764
Face and other sites	6	4.5 (2.7, 8.0)		11	5.0 (3.0, 10.0)	
Severity						
Mild	7	3.0 (2.0, 4.0)	<0.001	20	3.0 (2.0, 4.0)	<0.001
Moderate	11	8.0 (6.0, 8.0)		21	6.0 (5.0, 7.5)	
Severe	3	12.0 (11.0,)		15	12.0 (10.0, 13.0)	
Post inflammatory Hyperpigmentation						
Yes			0.876			0.001
No	15	7.0 (4.0, 9.0)		48	6.0 (4.0, 10.0)	
	6	6.5 (4.5, 9.3)		8	2.0 (2.0, 4.8)	
Presence of scarring						
Yes	17	7.0 (4.0, 9.0)	0.444	49	6.0 (4.0, 10.0)	0.004
No	4	5.5 (3.5, 7.5)		7	2.0 (2.0, 5.0)	

On comparison of the clinical and sociodemographic factors which impaired QOL; in males, only the severity of acne impaired QOL. While in females, severity of acne, age at presentation, presence of acne scar and presence of PIH impaired QOL. Duration, anatomical site, marital status, age at onset of acne and level of education did not affect the quality of life in both genders. Duration of acne had a P=0.840 in males and P= 0.095 in females. Anatomical site had a P=0.159 in males and P= 0.764 in females. Marital status had a P=0.680 in males and P= 0.151 in females Age

at on set had a P=0.740 in males and P= 0.575 in females. Level of education had a P=0.092 in males and P= 0.832 in females. Severity of acne commonly impaired QOL in both genders with P=0.001 Table 3.

The minimum and maximum CADI scores in males was 2 and 13 respectively, and 2 and 15 respectively in females. All parameters of the CADI were impaired in both genders. Although males had more impairment on the items of aggression and interference with social activity, this did not attain statistical significance Table 4.

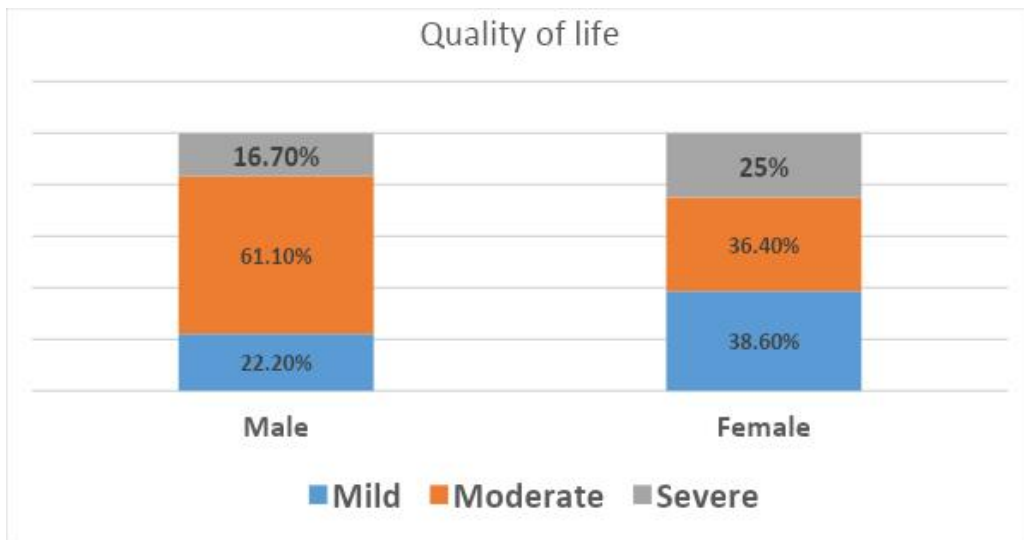


Fig. 1. QOL impairment using cadl

Table 4. Cardiff acne disability index

Index parameter	Male n=21 (%)	Female n=56 (%)	X2	P
Aggression in the last month				
Not at al	4 (19.0)	14 (25.0)		
yes	17 (81.0)	42 (75.0)	0.302	0.583
Interference with social life				
Not at al	9 (42.9)	31(55.4)		
yes	12 (57.1)	25 (44.6)	0.956	0.328
Avoided public changing facilities				
Not at al	15 (71.4)	41(73.2)		
yes	6 (28.6)	15 (26.8)	0.025	0.875
Feelings about appearance of skin				
Not bothered	1 (4.8)	3 (5.4)		
Bothered	20 (95.2)	53 (94.6)	0.011	1.000
Perception of how bad pimple were				
Not a problem	0 (0.0)	0 (0.0)	Invalid	
A problem	21 (100.0)	56 (100.0)		

4. DISCUSSION

Post adolescent acne (PAA) is increasingly being recognized and regarded to be different from adolescent acne [3,5,13]. Comparative studies of post adolescent acne between males and females are rare [1,2,15,23]. This study reveals some gender based differences in clinical features and QOL impairment. We demonstrate that, post adolescent acne and a family history of acne is more common in females. In addition, there are differences in lesion type, type of acne, QOL impairment and the factors which impair QOL.

In this study, PAA was more prevalent in females. This finding of more females with acne is similar to study reports by other authors of similar studies who also had more adult females in their studies [1,2,15,23]. The authors of this study hypothesize that, there are more females than males in this study either because females typically have a better health seeking behavior than males or that, there is a true increased female affectation. Our study however revealed a higher prevalence of male PAA than that in the study conducted by Goulden et al in 1999 [1]. Goulden et al's study was conducted almost 30 years ago when males would have felt effeminate attending a dermatology consult for acne unlike now.

The age at presentation was mostly in the late twenties to early thirties and presentation was noticed to decrease with increasing age. This finding was similar in both genders. However males were more likely to present in their late twenties and females in their thirties. We do not have an explanation for this difference in age at presentation. In 2012, Shen et al, in China reported a later age at presentation in females like we have reported [24]. In a study from the United Kingdom and the United States of America, like this study age at presentation was found to differ between males and females and to decrease with an increasing age[1,2]. Although not attaining statistical significance, the median age at presentation between males and females differed with females having a later age at presentation. The median age at presentation found in this study is similar to that in other studies[1,2].

There was a difference in age at onset with females having more of an adolescent onset and males having more adult onset. Age of onset was found to decrease with increasing age with only

females found to have an onset after age 40 years. Although, these differences were not statistically significant, they do point to a difference in age of onset and type of acne between the genders. Age of onset was found by other authors to decrease with age like in our study [2,6]. Unlike our study, in 2016 Dreno et al in their study of acne in Europe, found females to have a delayed onset of acne compared to males [6].

A family history of acne was significantly associated with the female gender. Overall severity of acne was moderate in both genders but more females had severe acne compared to males. A family history of acne is associated with an earlier onset of and severe acne, extension to the trunk and acne scars. [6] An early age of onset and severe acne was mostly associated with the females in this study in keeping with the observed relationship between a family history of acne and early age of onset by Dreno et al in 2016[6]. Conflicting reports of family history of acne is documented. While Dreno et al in multicenter study in Europe, report it more in males Skroza et al (in 2018), in Italy, report it more in females[6,25].

Another difference was in the subtype of acne. Males had more of late onset acne while females had more of persistent acne. This is in consonance with the earlier documented difference in age at onset. Other comparative studies on the type of acne a similar report of subtypes of acne like this study [2,25,26]. Our study finding however, differs from that in China where there was no gender based difference in persistent acne and females had more late onset acne (Shen et al, in 2012). Studies of female PAA though not comparative, report persistent acne as the main subtype of acne [13,17,19].

There was a statistically significant difference in lesion types. Females had more of mixed lesions and males more of non-inflammatory lesions. Studies of PAA in females reveal mixed lesions as the predominant lesion type [5,13,23]. Studies of male acne are few but following a study of males who had adolescent acne, non-inflammatory lesions were reported [8].

Although not statistically significant, males tended to have extra facial involvement compared to females. The reason for this difference is not known. In 2016 Dreno et al, in their study of acne in consonance with our study, had more extra facial involvement in males [6].

When acne scars were compared, there was no difference in a tendency to scarring between males and females. However, males were found to have more of icepick scars and females to have more of PIH. Acne scars have been documented to occur irrespective of the severity of acne. [27] Contrary to our study, Dreno et al found males to have more scars than females [27].

Quality of life was impaired in all the participants irrespective of gender and there was no difference in mean CADI between males and females. The mean CADI in this study is higher than that in the study conducted by Franca et al in 2017 but similar to that conducted by Gupta et al in 2016 [28,29] Also, our study differs from that by Skroza et al (2018), who found females to have a more impaired QOL[25]. Quality of life is a subjective assessment of patients of how a disease affects them and this is usually dependent on a number of factors [17,18,28]. Thus in this study, it was the presence of acne and not gender which influenced QOL.

The level of QOL impairment was moderate in males and severe in females. The males in this study had non-inflammatory acne unlike the females who had a mixed inflammatory pattern. Also, the females in this study had more of PIH. The colour difference between lesions of PIH was stand out on skin of colour making them embarrassing and a cause of concern. These may be the reasons for the severe QOL affectation in the females in this study. In Italy, QOL was more impaired in females similar to this study [25].

There was a difference in the factors that impaired QOL. In males the only factor that impaired QOL was severity of acne. In females on the other hand, besides severity of acne, age at presentation, presence of acne scar and presence of PIH impaired QOL. Several factors may have influenced this negative impact of acne scars on the QOL of these females. Quality of life was more impaired in younger females. Public perception of people who have acne scars especially when facial is reported to be negative [30]. Furthermore, acne scars especially PIH give a negative cosmetic outlook. Anecdotally, females are said to have a more cosmetic consciousness than males. Franca et al in their study of PIH and QOL did not find any gender based difference in QOL impairment [29]. Similar to our study, Gupta et al were unable to correlate

QOL impairment with marital status, age of onset, duration of acne, anatomical location of acne, age of presentation and family history[28].

All items on the CADI were impaired with no difference between the genders. However, males had more impairment with interference with social life and relationships than females. This may be because acne is regarded as a problem of adolescents and women. Having colleagues, friends and relations ask questions about acne would be embarrassing to these males. There is as yet no study comparing items of CADI impairment between males and females [25, 28].

5. CONCLUSION

In conclusion, there are gender based differences in the sociodemographic, clinical features and QOL impairment in post adolescent acne. Post adolescent acne and a family history of acne are more prevalent in females. Females have a delayed age of onset compared to males. Males have late onset acne and non-inflammatory acne compared to females who have persistent acne and mixed lesions. In addition, the type of scars differs with females having PIH and males icepick scars. Although QOL was impaired in all, females had more of severe impairment and males, moderate impairment. Males had more impairment with interference with social life and relationships than females. The only factor which impaired QOL in males was severity of acne but in females, severity of acne, age at presentation, presence of acne scar and presence of PIH impaired QOL.

6. LIMITATION

There were some limitations to this study. This was a one site study. Also, this study was conducted at a referral center attended by those with more severe disease. The result of this was a limited number of patients to study despite the adequate length of study time. We feel that a multicenter study with inclusion of more patients will be needed to corroborate the findings in this study.

CONSENT

As per international standard or university standard, patients' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

This study was conducted at the skin clinic of the Lagos state university teaching hospital following ethical committee approval

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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