

Level of adherence to acne treatment and associated factors in patients with acne in Yaoundé, Cameroon (sub-Saharan Africa)

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ABSTRACT

Background: Acne is a chronic inflammatory disease of the pilosebaceous follicle. The aim of this study was to assess the level of adherence to acne treatment and to identify factors associated with adherence to therapy in patients with acne. **Materials and Methods:** This was a descriptive, analytical, cross-sectional study conducted from January to April 2017 in three hospitals in Yaoundé. We included patients followed for acne for at least one month. The sampling was consecutive and exhaustive. Adherence to treatment was assessed according to the Morisky score. Data was analyzed with Microsoft Excel 2013 and the SPSS software, version 23. We employed the ANOVA test to find associations between the different variables. *p* values below 0.05 were considered statistically significant. **Results:** A total of 113 patients were selected, with a mean age of 26.0 ± 6.4 years. The mean Morisky score was 5.6 ± 1.9 . Adherence to treatment was low, medium, and high in 58 (51%), 31 (28%), and 24 (21%) patients, respectively. The factors associated with low adherence were the presence of relapses, a psychological history, the number of previous treatments above two, and the duration of treatment above three months. **Conclusion:** Adherence to acne treatment was low in over half of the patients. In our context, the presence of relapse, a psychological history, the number of previous treatments above two, and the duration of treatment above three months were associated with low adherence to therapy.

Key words: Acne; treatment adherence; associated factors; Cameroon; sub-Saharan Africa

INTRODUCTION

Acne is a chronic inflammatory disease of the pilosebaceous follicle that progresses in flare-ups [1]. Acne is a common skin disease that usually begins at puberty, affecting up to 80% of adolescents, and may persist beyond adolescence or, to a lesser extent, appear in adulthood [2-4]. In 2009, it represented 7.7% of dermatoses in dermatology consultation at the Yaoundé General Hospital, thus constituting the third reason for consulting [5].

Despite the multitude of anti-acne drugs, the management of this common pathology remains difficult due to low adherence to anti-acne treatment. Adherence to any treatment is a transdisciplinary problem; in the literature, the level of adherence to a treatment varies from 50% to 60% regardless of the discipline [6]. For the specific case of acne treatment, adherence is low according to the literature. There are two types of obstacles to treatment adherence: primary (obstacles to initiating treatment) and secondary (obstacles to adherence and causes of the premature

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discontinuation of treatment) [6]. Therapeutic adherence is one of the keys to therapeutic efficacy. Lack of therapeutic adherence and, therefore, therapeutic failure, combined with the chronicity of acne and its inaeesthetic character contribute to the alteration of the patient's quality of life (QoL). According to Moradi Tuchayi et al., it is important to identify obstacles to therapeutic adherence to anti-acne treatment, determine solutions, and prescribe the appropriate therapeutic protocol for each patient [6].

In sub-Saharan Africa, in general and more particularly in Cameroon, a developing country with its own socio-cultural and economic context, we also experience non-compliance to anti-acne treatment and a lack of adherence to treatment in some patients during our dermatological consultations. The aim of this study was to assess the level of adherence to anti-acne treatment and determine the factors associated with adherence in patients seen in the outpatient dermatology clinic in Yaoundé.

MATERIALS AND METHODS

Type, Site, and Duration of the Study

This was a four-month, descriptive, analytical, cross-sectional study conducted from January to April 2017 in three hospitals in Yaoundé. These hospitals were chosen by convenience based on the availability of a dermatologist: 'Biyem-Assi District Hospital (BADH), Elig-Essono District Medical Center (EE-DMC), and University Teaching Hospital of Yaoundé Center (UTHY).

Study Population and Criteria of Selection

We included patients with acne seen in the aforementioned hospitals: 1) presenting for a follow-up consultation after a medical prescription for an anti-acne medication initiated at least one month previously, 2) received a dermatology consultation after failure of the current anti-acne treatment or stopped for less than a month, 3) having given their informed consent to participate in the study.

Sampling

Sampling was consecutive and exhaustive during the study period. The minimum sample size was calculated by the Cochrane formula for descriptive studies,

considering a prevalence of 7.7% for acne reported in hospitals in Cameroon by Bissek et al. [5] and a degree of precision of 0.05, hence the minimum number of 109 participants.

Procedures

Data collection

Data collection was performed with a technical sheet and proceeded in several stages: 1) the recruitment of participants was conducted during dermatological consultations; patients fulfilling the selection criteria were selected for the study; 2) clinical examination: the questionnaire searched for sociodemographic characteristics and determined the history of acne; a physical examination allowed for the description and classification of the clinical type and the assessment of severity with the Acne Lesions Rating Scale (ECLA) grid; 3) the assessment of the impact of acne on QoL with the Cardiff Acne Disability Index (CADI) questionnaire; 4) the assessment of therapeutic adherence with the Morisky score.

Data Collection Tools

Technical form

The technical form included socio-demographic characteristics (age, sex, profession, level of education), history of acne, clinical type, and the ECLA grid with its 3 factors F1, F2, and F3 [7].

Quality-of-Life Assessment Tool (CADI)

The CADI questionnaire is a QoL grid designed to assess QoL in adolescents and adults with acne. It is composed of five items [8].

Therapeutic adherence assessment tool: Abreviation of Morisky Medication Adherence Scale 8 is MMAS-8.

This is a validated, self-administered questionnaire that assesses adherence to treatment with a sensitivity greater than 90% [9]. It consists of eight questions, each with two answers to choose from: *yes* and *no*.

INTERPRETATION OF SCALES AND DATA ANALYSIS

Interpretation of Scales

Interpretation of the acne lesions rating scale

The total score was obtained by adding the scores of factors F1, F2, and F3, ranging from 0 to 36. An ECLA

score of 12 or below represented mild to moderate acne, while a score above 12 represented severe acne.

Interpretation of the CADI quality of life score

The score for each response ranged from 0 to 3 points for each question. The CADI score was calculated by adding the score for each question, varying from 0 to 15. The interpretation was as follows: 1) 0: no alteration in QoL; 2) 1–5: mild alteration in QoL; 3) 6–10: moderate alteration in QoL; 4) 11–15: severe alteration in QoL.

Interpretation of the assessment score for adherence to MMAS-8 treatment

Adhesion was assessed in accordance with MMAS-8 by adding the number of points for each question. Thus, adhesion was graded as follows: 1) *low* for a score below 6; 2) *medium* for a score between 6 and 7; 3) *high* for a score equal to 8.

Statistical Analysis

The data collected was analyzed with SPSS, version 23, and Microsoft Excel 2013. The results were presented in the form of tables and figures and expressed in terms of means ± standard deviations for the quantitative variables on one hand and, in terms of numbers and percentages, for the qualitative variables on the other. We employed the ANOVA test to find associations between qualitative and quantitative dependent variables (level of adherence assessed with the Morisky score). *p* values below 0.05 were considered statistically significant.

ETHICAL CONSIDERATIONS

We obtained ethical clearance from the Institutional Ethics and Research Committee of the Faculty of Medicine and Biomedical Sciences. Research authorizations were obtained from the competent authorities of the hospitals. We conducted our study in strict accordance with the fundamental principles of the Helsinki Declaration on research involving persons.

RESULTS

Description of Sociodemographic Characteristics

During the study period, a total of 1930 patients were seen in dermatology consultation. Among these, we

recruited 113 predominantly female participants (83.2%), with a sex ratio of 0.2. The mean age was 26.0 ± 6.4 years, with extremes of 8 and 48 years.

Students were the most represented (57.5%) in our sample. We also noted a predominance of individuals with higher school education (70.8%).

Level of Adherence to Acne Treatment and Associated Factors

Adherence level

The mean treatment adherence score assessed by the Morisky score was 5.6 ± 1.9. In our sample, more than half of the patients had a low level of treatment adherence (58; 51.3%); (Fig. 1).

Factors Associated with Adherence to Acne Treatment

Adhesion level and sociodemographic characteristics

Adherence to treatment seemed not to be influenced by the different sociodemographic characteristics studied (sex, profession, level of education) (Table 1).

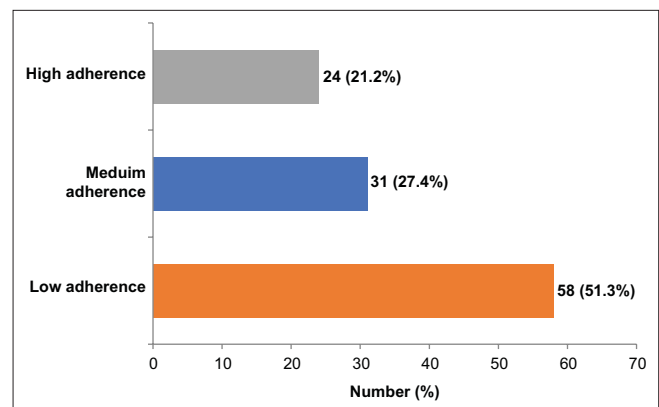


Figure 1: Level of adherence to acne treatment (n = 113).

Table 1: Sociodemographic characteristics (n = 133).

Variables	Morisky Score		p value
	Number	Mean	
Sex			
Male	19	5.9 ± 1.7	0.41
Female	94	5.5 ± 2.0	
Profession			
Unemployed	73	5.5 ± 2.0	0.85
Employed	40	5.6 ± 1.9	
Education			
Primary	7	5.8 ± 2.6	0.93
Secondary	26	5.5 ± 1.9	
University	80	5.6 ± 1.9	

Acne adhesion level and history

In our study, four variables explained the lack of adherence to treatment with a statistically significant association ($p < 0.05$). These were the notion of relapses ($p = 0.0001$), the duration of treatment ($p = 0.002$), the number of previous treatments ($p = 0.003$), and a history of psychological or psychiatric follow-up ($p = 0.012$) (Table 2). We deduced that the absence of relapses or a psychological history, the duration of treatment below three months, and the number of previous treatments equal to two or less would be associated with high adherence to treatment. In addition, the mean scores in patients on oral, topical, or combined therapy were 5.8 ± 1.8 , 5.4 ± 1.9 , and 5.6 ± 1.7 , respectively. Patients, therefore, seemed to adhere better in the presence of oral treatment. However, this relationship was not statistically significant ($p < 0.05$) (Table 3).

Level of Adherence to Acne Treatment, Clinical Severity of Acne, and Quality of Life

We failed to find a statistically significant association between the severity of acne assessed with the ECLA score on one hand and the quality of life assessed with the CADI score and the level of adherence on the other ($p > 0.05$) (Table 4).

DISCUSSION

The aim of this work was to assess the level of adherence to anti-acne treatment and to research factors influencing this adherence in the sub-Saharan context, particularly, in Cameroon. Our participants were predominantly young (mean age: 26.0 ± 6.4 years; range: 8–48 years). According to the Morisky score (validated subjective assessment tool measuring adherence to anti-acne treatment), only 21.2% of our patients had a high adherence level to their treatment. Factors that influenced high adherence to treatment were the absence of relapses under treatment, the absence of a psychological history, the duration of treatment below three months, and the number of previous treatments equal to two or less.

Adherence to treatment influences its therapeutic effectiveness. This therapeutic adherence remains a real challenge for clinicians as the overall adherence to treatment, all specialties combined, falls at between 50% and 60% [6]. Tan et al. in their series in the U.S.

Table 2: Association between the acne history and the level of adherence ($n=133$).

Variables	Morisky Score		p value
	Number	Mean	
Symptom onset (yrs.)			
< 10	5	3.7 ± 2.4	0.175
[10–24]	82	5.6 ± 1.9	
≥ 25	26	5.9 ± 1.8	
Therapeutic education			
Yes	56	5.5 ± 2.1	0.729
No	57	5.6 ± 1.8	
Relapse			
Yes	68	5.0 ± 1.8	0.0001*
No	45	6.3 ± 1.9	
Psychiatric and psychologic history			
Yes	4	3.2 ± 2.9	0.012*
No	109	5.6 ± 1.9	
Comorbidities			
Yes	10	4.9 ± 1.9	0.266
No	103	5.6 ± 1.9	
Number of previous treatments			
[1–2]	82	5.9 ± 1.9	0.003*
[3–4]	23	4.5 ± 2.0	
≥ 5	8	4.8 ± 1.6	
Duration of treatment (months)			
1–3	54	6.2 ± 1.9	0.002*
4–6	12	5.4 ± 2.1	
7–12	17	4.7 ± 1.8	

Table 3: Level of adherence and treatment ($n=133$).

Variables	Items	Morisky Score		p value
		Number	Mean	
Treatment	Local	98	5.4 ± 1.9	0.05
	Oral	69	5.8 ± 1.8	
	Combined	54	5.6 ± 1.7	
Adverse effects of local treatment	No	71	5.5 ± 2.1	0.72
	Yes	27	5.3 ± 1.5	
Frequency of daily application	Once	66	5.7 ± 1.8	0.06
	Twice	3	7.7 ± 1.6	
Adverse effect of oral treatment	No	55	5.4 ± 1.9	0.08
	Yes	14	6.4 ± 2.0	
Changement under treatment	Amelioration	90	5.4 ± 1.9	0.19
	None or aggravation	23	6.0 ± 2.1	

Table 4: Association between severity (ECLA score), quality of life (CADI score), and the level of adherence (Morisky score).

Variables	Items	MMAS-8 Score		p value
		Number	Mean \pm ET	
ECLA score	Mild to moderate acne	84	5.5 ± 2.0	0.856
	Severe acne	29	5.6 ± 1.9	
CADI score	None	1	5.0 ± 0.0	0.576
	Mild	45	5.3 ± 1.9	
	Moderate	54	5.8 ± 2.0	
	Severe	13	5.6 ± 1.9	

found especially low therapeutic adherence to anti-acne treatment (11.8%) [10].

This corroborated our results, since only 21.2% of our participants had a high level of adherence to treatment. However, even if therapeutic adherence to acne treatment is never ideal, a meta-analysis by Snyder et al. underlines a great disparity in the level of therapeutic adherence. According to them, adherence varied from 7% to 96% for topical treatments and from 35.2% to 60% for systemic treatments [11]. These significant differences between the studies were linked to methodological differences, in particular, the use of different evaluation grids, thus enhancing the problem of reproducibility. Reproducibility is, indeed, difficult as most of the grids employed are not only different, yet are, above all, subjective. They are based on the patient's memory, such as the patient's ability to remember the names of the drugs they have been using [11]. Objective methods, such as counting tablets during consultations, are less often employed. In the meta-analysis by Snyder et al., 3 of the 14 studies employed objective methods [11]. The Morisky scale that we used in this work was certainly a subjective, yet validated method [9]; moreover, it seemed to us to be more appropriate. Indeed, while the counting of remaining tablets (oral treatment of acne) was easy to perform during routine consultations, the objective evaluation of the use of creams seemed more difficult to us. This difficulty stems, among other things, from the fact that, even if the precision scale is available, the amount of cream administered daily by each patient differs due to the variable application site from one patient to another.

The subsequent standardization of tools for assessing adherence in the specific case of acne would allow to better share experience between researchers and clinicians and a more comprehensive and efficient approach to solving the issue of adherence.

Furthermore, the mean adherence score in patients taking oral versus topical treatment was 5.8 ± 1.8 versus 5.4 ± 1.9 , meaning better adherence to oral treatment when compared to topical treatment. Nevertheless, this difference may be explained by beliefs in the African context in general and in the Cameroonian in particular. Indeed, in the Cameroonian sociocultural context, there are popular beliefs according to which systemic drugs are more effective and act better from "inside" because of their "direct" passage through the body. In addition, several studies have noted superiority in adherence to oral treatment when compared to topical treatment [10,12].

Better adherence to oral treatment may also be justified by the rapid and undeniable effectiveness of oral isotretinoin, particularly in severe forms of acne. The rapid clinical efficacy of the molecule could encourage the patient to be more observant. This suggestion was supported by Tan et al., who specifically reported the effectiveness of isotretinoin treatment adherence when compared to antibiotics and topical treatment [12]. It should be noted, however, that some authors are not unanimous on the superiority of adherence to oral treatment when compared to topical treatment, as a recent work by Salamzadeh et al. has concluded that there is no significant difference in adherence between patients taking oral versus topical therapy [13]; this superiority, when found, is believed to be linked to isotretinoin. It would be appropriate to point out in favor of low adherence to systemic treatment, the conditions for taking certain anti-acne antibiotics, which could reduce compliance, in particular, taking them during a meal (to limit digestive side effects) and taking them in the evening (to limit phototoxicity, which is relatively common in the tropical zone).

Factors significantly associated with adherence to treatment were no relapse, no psychological history, the number of previous treatments less than two and the duration of treatment below three months ($p < 0.05$). The duration of treatment above three months and the presence of relapses could cause discouragement in patients, explaining the negative impact on treatment adherence. Regarding the negative impact of a psychological history on adherence to therapy, Moradi et al. in their meta-analysis identified and classified them among the secondary obstacles to treatment adherence [6].

Patients with psychiatric or psychological co-morbidities may lack understanding of the disease and treatment and frequently forget to take their medication. Identifying psychiatric co-morbidities in acne patients and proposing a therapeutic education plan adapted to their co-morbidity may provide a solution for this group of patients. Sex, onset of the lesions, side effects, and frequency of administration did not significantly influence adherence to treatment in our patients. Similar trends were found by Salamzadeh et al. in Iran, where patient adherence was not influenced by sex [13]. Conversely, an American study even found therapeutic adherence significantly associated with males [10]. Nevertheless, in 2008,

Jones Caballero et al. reported better adherence in females in Spain ($p < 0.05$) [14].

One would always expect to observe higher therapeutic adherence to anti-acne treatment in females when compared to males as females are generally more concerned about their appearance, yet this disparity could, today, reflect an increasingly frequent search for aesthetics in males as well. Some studies raise the age beyond 18 to 20 years as a factor of high therapeutic adherence. Growing beyond adolescence, patients may take medical prescriptions more seriously, especially with regard to respecting the rhythm of application of topical anti-acne and/or taking oral medications [10,14].

Moreover, with the popularization of mobile phones, computers, and the Internet, it seems important to note the American work by Park et al. [12] and the Italian work by Donnarumma et al. [15] and Fabbrocini et al. [16], who proved the effectiveness of daily or even twice-daily SMS reminders and the use of web-based acne training and monitoring tools. In addition to improving therapeutic adherence to acne treatment, these tools improved patient satisfaction. Experimental studies with similar tools in the Cameroonian context could be performed and contribute to the improvement of therapeutic adherence if effectiveness is also proven in our context.

Limitations of the Study

Certain aspects of this work might have constituted limits: 1) data collection tools, namely the acne lesion rating scale (ECLA) and the CADI grid, which assessed QoL, validated the Caucasian population and not the Negroid population; 2) the evaluation of adherence to treatment using indirect and, therefore, subjective methods could have made our results insensitive; 3) the lack of standardized tools for measuring adherence made it difficult to compare results and share experience between researchers and clinicians. However, this study could constitute a preliminary for further work on a larger scale or even experimental studies.

CONCLUSION

This study enabled us to observe a low level of adherence to anti-acne treatment in more than half of the patients in the Cameroonian context. The

factors to be controlled in order to improve therapeutic adherence are relapses, psychiatric and psychological comorbidities, treatment longer than three months, and the multiplicity of previous cures. In the digital age, exploring the contribution of SMS and web tools to therapeutic adherence during subsequent studies in our context would be relevant.

Statement of Human and Animal Rights

All the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the 2008 revision of the Declaration of Helsinki of 1975.

Statement of Informed Consent

Informed consent for participation in this study was obtained from all patients.

REFERENCES

1. Muguet Guenot L, Vourc'h Jourdain M, Saint Jean M, Corvec S, Lemoigne M, Khammari A, et al. Microscopie confocale et acné de la femme adulte. *Ann Dermatol Vénéréol.* 2017;144(12, Supplement):S177-8.
2. Dréno B, Thiboutot D, Layton AM, Berson D, Perez M, Kang S. Large-scale international study enhances understanding of an emerging acne population: Adult females. *J Eur Acad Dermatol Venerol.* 2015;29:1096-6.
3. Troin L, Mallet S, Lagouanelle M-C, Scannapieco F, Lignon C, Gaudy-Marqueste C, et al. [Five years' experience of cosmetic camouflage of disfiguring skin disorders: Patient satisfaction]. *Ann Dermatol Vénéréol.* 2020;147:4-8.
4. Wolkenstein P, Machovcová A, Szepietowski JC, Tennstedt D, Veraldi S, Delarue A. Acne prevalence and associations with lifestyle: A cross-sectional online survey of adolescents/young adults in 7 European countries. *J Eur Acad Dermatol Venerol.* 2018;32:298-306.
5. Bissek AZ-K, Kouotou E, Defo D, Njamnshi KA, Koueke P, Muna W. Epidémiologie des dermatoses à l'Hôpital Général de Yaoundé. *Health Sci Dis.* 2013;10:1.
6. Moradi Tuchayi S, Alexander TM, Nadkarni A, Feldman SR. Interventions to increase adherence to acne treatment. *Patient Prefer Adherence.* 2016;10:2091-6.
7. Dreño B, Bodoich I, Chivot M, Daniel F, Humbert P, Poli F, et al. La grille ECLA : un système de cotation de l'acné pour la pratique quotidienne du dermatologue. *Ann Dermatol Vénéréol.* 1999;126:136-41.
8. Motley RJ, Finlay AY. Practical use of a disability index in the routine management of acne. *Clin Exp Dermatol.* 1992;17:1-3.
9. Morisky DE, Ang A, Krousel-Wood M, Ward HJ. Predictive validity of a medication adherence measure in an outpatient setting. *J Clin Hypertens.* 2008;10:348-54.
10. Tan X, Al-Dabagh A, Davis SA, Lin H-C, Balkrishnan R, Chang J, et al. Medication adherence, healthcare costs and utilization associated with acne drugs in Medicaid enrollees with acne vulgaris. *Am J Clin Dermatol.* 2013;14:243-51.
11. Snyder S, Crandell I, Davis SA, Feldman SR. Medical adherence to acne therapy: A systematic review. *Am J Clin Dermatol.* 2014;15:87-94.
12. Park C, Kim G, Patel I, Chang J, Tan X. Improving adherence to

- acne treatment: The emerging role of application software. *Clin Cosmet Investig Dermatol*. 2014;7:65-72.
13. Salamzadeh J, Torabi Kachousangi S, Hamzelou S, Naderi S, Daneshvar E. Medication adherence and its possible associated factors in patients with acne vulgaris: A cross-sectional study of 200 patients in Iran. *Dermatol Ther*. 2020;33:e14408.
 14. Jones-Caballero M, Pedrosa E, Peñas PF. Self-reported adherence to treatment and quality of life in mild to moderate acne. *Dermatology*. 2008;217:309-14.
 15. Donnarumma M, Fattore D, Greco V, Ferrillo M, Vastarella M, Chiodini P, et al. How to increase adherence and compliance in acne treatment? A combined strategy of SMS and visual instruction leaflet. *Dermatology*. 2019;235:463-70.
 16. Fabbrocini G, Izzo R, Donnarumma M, Marasca C, Monfrecola G. Acne smart club: An educational program for patients with acne. *Dermatology*. 2014;229:136-40.

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