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Therapeutic Itinerary and Management of Patients Treated for Acne at the Dermatology and Venereology Department of National University Hospital Center Hubert Koutoukou Maga of Cotonou (Benin)

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Abstract

Introduction: Acne is an inflammatory disease of the pilosebaceous follicle that most often appears during puberty but also in some adults. Most acne patients resort to self-medication before consulting a dermatologist. This practice can have a negative impact on the progression and/or aesthetic prognosis of this condition. The aim of this study was to describe the therapeutic itinerary and management of patients followed for acne at the University Clinic of Dermatology and Venereology. **Patients and Method:** This was a retrospective and prospective longitudinal study, both descriptive and analytical, running from 1 January 2018 to 31 December 2022 (retrospective phase), and from 1 January 2023 to 30 September 2023 (prospective phase). **Results:** A total of 768 acne patients were included, with 667 enrolled during the retrospective phase and 101 during the prospective phase. The hospital frequency of acne was 5.6%. There was a female predominance with a sex ratio of 0.4. The majority of patients (83.2%) had practiced self-medication before consulting at the National University Hospital Center Hubert Koutoukou Maga (NUHC-HKM) of Cotonou, among which 23.3% used lemon as a traditional. Inflammatory acne was predominant in 89.2% of patients. Topical treatment at the NUHC-HKM dermatology unit was based on tretinoin for 50.3% of patients

and dermo-cosmetics for 97.1%. Doxycycline tablets were prescribed to 92.2% of treated patients. The patient compliance rate improved significantly over time, rising from 53.5% at the first follow-up visit to 95% by the third ($p = 0.036$). **Conclusion:** Self-medication was the main recourse in the therapeutic itinerary of acne patients. Local treatments were more frequently prescribed at the NUHC-HKM dermatology unit than systemic treatments. Most patients had good therapeutic adherence.

Keywords

Therapeutic Itinerary, Acne, Self-Medication, NUHC-HKM

1. Introduction

Acne is an inflammatory disease of the pilosebaceous follicle that most often appears during puberty, affecting 80% of teenagers. The first "acne outbreaks" occur during puberty. This is known as polymorphic juvenile acne because patients present with different types of lesions. A quarter of adults (particularly women between 25 and 40 years old) are also affected by this disease, which is called late-onset acne [1].

Most acne patients engage in self-medication, using both traditional and modern products. They only seek specialized care when these attempts fail. This behavior delays treatment and increases the likelihood of scarring. Pharmacists, as healthcare professionals who are easily accessible, often become the first point of contact for acne patients. Pharmacists frequently recommend medications for mild acne or, when necessary, refer patients to dermatologists for appropriate care, thereby putting patients in touch with the medical team more quickly [2]. However, acne patients often follow advice from non-healthcare professionals.

In Africa, and particularly in Benin, no studies have been conducted on the therapeutic itinerary of acne patients. The aim of this survey is to retrace the therapeutic journey of acne patients from the onset of the disease until their consultation in the Dermatology-Venereology unit of NUHC-HKM in Cotonou, and to describe the therapeutic methods used in the clinic.

2. Patients and Method

This was a longitudinal retrospective and prospective study, both descriptive and analytical, covering the period from 1 January 2018 to 30 September 2023. All patients who consulted the Dermatology-Venereology unit of NUHC-HKM in Cotonou during the study period, and in whom the diagnosis of acne was made on the basis of clinical evidence were included. For the retrospective phase, we included former patients seen and treated for acne between 1 January 2018 and 31 December 2022, whose medical records were available and usable. For the prospective phase, we included new acne patients seen in consultation in the department from 1 January 2023 to 30 September 2023. The prospective phase provided

reliable data to assess both the itinerary and the therapeutic aspects within the clinic. Ethical standards were respected.

The Kobocollect platform and Excel software were used for data entry. Statistical analysis was performed using R software version 4.3. Quantitative descriptive variables were expressed as the mean with the standard deviation when the distribution was normal (assessed by the Shapiro test). If the distribution was asymmetric, the median and quartiles were used. Qualitative variables were described as proportions in percentages. Ethical guidelines were followed.

3. Results

During the study period, 992 acne patients were seen out of a total of 17,685 dermatology consultations, representing a hospital frequency of 5.6%. However, 224 records were excluded from the study for various reasons (lack of prescribed treatment, missing records, or refusal to participate in the prospective study). Therefore, 768 acne patients were included in this study, 667 of whom were recorded during the retrospective phase, and 101 during the prospective phase.

The age of the patients ranged from 7 months to 78 years, with an average of 26.9 ± 10.5 years. Patients aged 18 to 24 years were the most represented group (37.3%). The gender distribution showed a predominance of females (73.2%), with a male-to-female ratio of 0.4. More than half (59.3%) of the patients interviewed (in the prospective phase) had come to the NUHC-HKM dermatology unit on their own initiative (Figure 1).

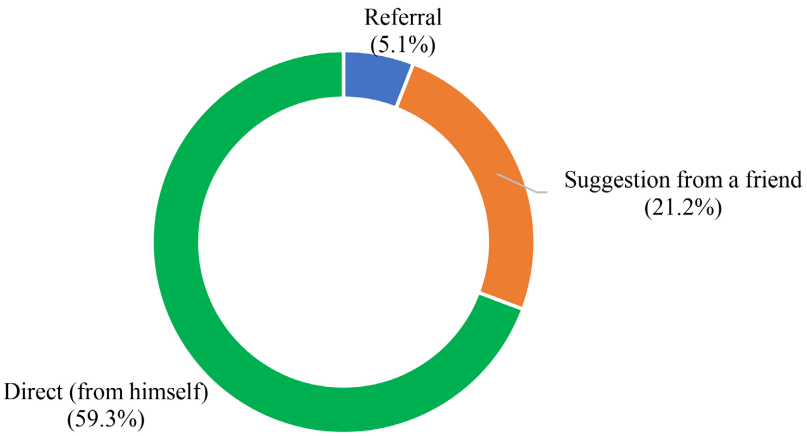

Figure 1. Distribution of acne patients followed at NUHC-HKM in Cotonou from 1 January to 30 September 2023, according to their mode of admission (N = 101).

The majority of patients (83.2%) had already undergone some form of treatment before consulting at NUHC-HKM, and self-medication with modern products (85.6%) was the most commonly practiced method (Figure 2). Sixty traditional products were used by patients in their therapeutic journey. Among these products, lemon was used by more than 23%, followed by honey (11.1%), green clay (10.5%), aloe (7.9%), and turmeric (7.8%) (Table 1).

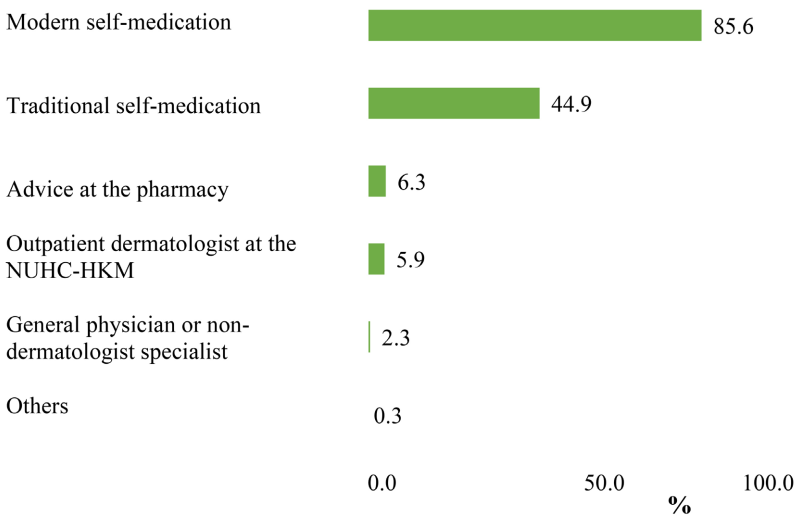

Figure 2. Distribution of acne patients treated at NUHC-HKM in Cotonou from 2018 to 2023, according to their therapeutic itinerary before consultation.

Table 1. List and frequency of quotation of traditional products applied by acne patients followed at NUHC-HKM in Cotonou from 2018 to 2023.

	Number of quotation	Frequency of quotation (%)
Lemon	138	23.3
Honey	66	11.1
Green clay	62	10.5
Aloe	47	7.9
Turmeric	46	7.8
Tomato	32	5.4
Sodium bicarbonate	29	4.9
Shea butter	27	4.6
Palm oil	15	2.5
Traditional soap	11	1.9
Cucumber	11	1.9

Acne patients who practiced modern self-medication mainly used products such as a combination of corticosteroids, antifungals, and antibiotics (22.5%). Additionally, among patients who followed pharmacy advice, 45% took doxycycline tablets. Non-dermatologist doctors (general practitioners and other specialists) prescribed a medication combination to 26.7% of patients. Dermatologists consulted by patients before their admission to NUHC-HKM more frequently prescribed doxycycline tablets (47.4%).

The age of patients at the onset of acne ranged from birth to 76 years, with an average age of 20.6 ± 10.2 years. For half of the patients, acne started between the ages of 9 and 17. The majority of patients presented papular lesions (96.3%), followed by hyperpigmented macules (72.5%), microcysts (67.5%), and comedones

(65.5%). For nearly all patients, the lesions were located on the face (98.1%). Inflammatory acne was the most observed type (89.2%).

Regarding the therapeutic management of patients, almost all received dermo-cosmetic products (97.1%) in addition to their local treatment. The most prescribed dermo-cosmetic product was a sebum-regulating gel (82.2%). Tretinoin and benzoyl peroxide were also frequently prescribed to 50.3% and 45.7% of patients, respectively (Table 2 and Table 3).

Table 2. Distribution of acne patients treated at NUHC-HKM in Cotonou from 2018 to 2023 according to the main local treatments received.

	Number (N = 759)	Percentage (%)
Dermo-cosmetic products	737	97.1
Tretinoin	382	50.3
Benzoyl peroxide	347	45.7
Clindamycin	127	16.7
Erythromycin	122	16.1

Table 3. Distribution of acne patients treated at NUHC-HKM in Cotonou from 2018 to 2023 according to the main dermo-cosmetic products received.

	Number (N = 737)	Percentage (%)
Sebum-regulating gel	606	82.2
Soothing anti-blemish cream	555	75.3
Keratoregulating cream	192	26.1
Other adjuvants	88	11.9
Sunscreen cream	61	8.3
Moisturizing cream	45	6.1
Antiseptic soap	44	6.0
Surgras soap	36	4.9
Anti-hyperpigmentation cream	31	4.2
Mattifying cream	17	2.3
Marseille soap	13	1.8

Regarding systemic treatment, doxycycline tablets were widely prescribed by dermatologists in our study, given to 92.2% of patients. Other antibiotics, such as lymecycline (4%), azithromycin (2.8%), minocycline (1.8%), and erythromycin (1.5%) were also occasionally prescribed (Figure 3).

In this study, the evaluation of patient adherence was conducted during the prospective phase over a minimum period of three months, using the Girerd scale. The proportion of patients adhering to acne treatment varied significantly during therapeutic follow-up ($p = 0.048$). It increased from 53.5% at the first follow-up visit to 95% at the third follow-up visit (Figure 4 and Table 4).

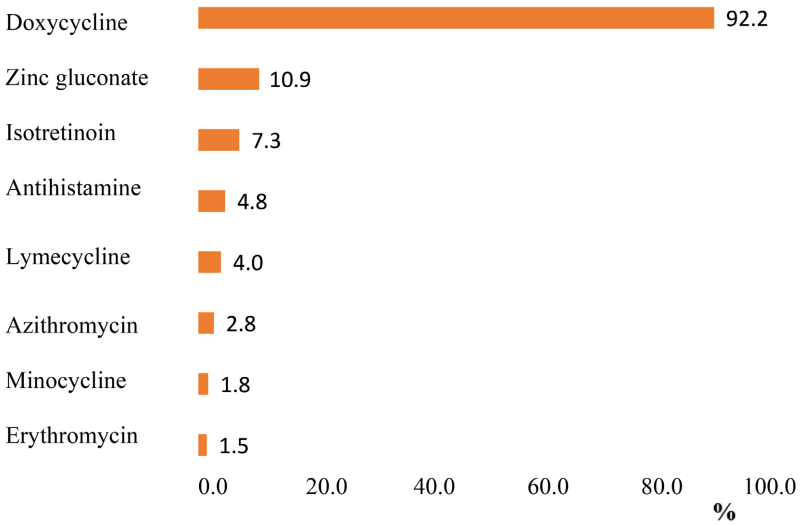

Figure 3. Distribution of acne patients treated at NUHC-HKM in Cotonou from 2018 to 2023 according to the type of systemic medications received (N = 396).

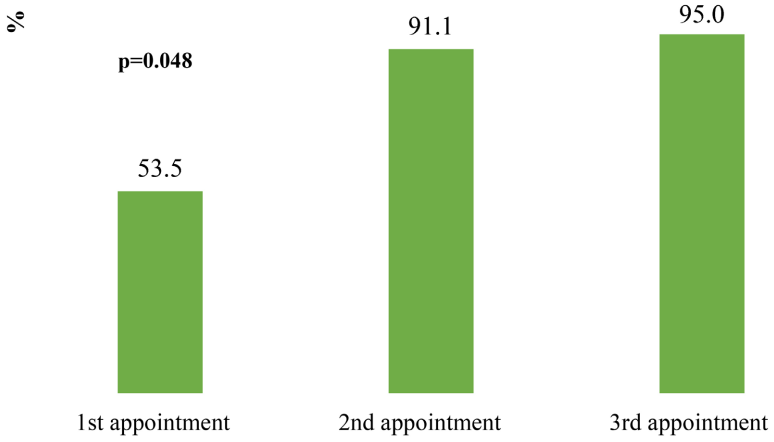

Figure 4. Distribution of acne patients treated from 1 January to 30 September 2023 at NUHC-HKM in Cotonou according to their treatment adherence.

Table 4. Therapeutic response of acne patients followed at the NUHC-HKM of Cotonou from 2018 to 2023 according to the main socio-demographic and clinical characteristics, previous treatments and therapeutic compliance.

	Total (N)	Worsening		Favourable		Stationary		p
		n	(%)	n	(%)	n	(%)	
Age (year)								0.778
0 - 17	37	6	(16.2)	27	(73.0)	4	(10.8)	
18 - 24	88	15	(17.0)	54	(61.4)	19	(21.6)	
25 - 39	73	10	(13.7)	49	(67.1)	14	(19.2)	
40 - 78	48	10	(20.8)	29	(60.4)	9	(18.8)	
Gender								0.14
Female	192	32	(16.7)	129	(67.2)	31	(16.1)	

Continued

Male	54	9	(16.7)	30	(55.6)	15	(27.8)	
Admission procedure								0.282
Referral	4	1	(25.0)	3	(75.0)	0	(0.0)	
Suggested by others	15	2	(13.3)	11	(73.3)	2	(13.3)	
Self-referred	38	1	(2.6)	31	(81.6)	6	(15.8)	
Previous treatments								0.788
No	32	4	(12.5)	21	(65.6)	7	(21.9)	
Yes	214	37	(17.3)	138	(64.5)	39	(18.2)	
Traditional product								0.875
No	106	17	(16.0)	67	(63.2)	22	(20.8)	
Yes	116	20	(17.2)	75	(64.7)	21	(18.1)	
Psycho-social repercussions								0.845
No	16	1	(6.3)	14	(87.5)	1	(6.3)	
Yes	38	2	(5.3)	30	(78.9)	6	(15.8)	
Location of lesions								
Face	239	40	(16.7)	154	(64.4)	45	(18.8)	0.613
Neck	8	1	(12.5)	5	(62.5)	2	(25.0)	0.868
Chest	85	16	(18.8)	55	(64.7)	14	(16.5)	0.69
Back	61	12	(19.7)	40	(65.6)	9	(14.8)	0.566
Clinical form acne								
Retention acne	156	23	(14.7)	106	(67.9)	27	(17.3)	0.486
Inflammatory acne	214	37	(17.3)	137	(64.0)	40	(18,7)	0.471
Acne conglobata	4	0	(0.0)	3	(75.0)	1	(25.0)	1
Nodulocystic acne	5	1	(20.0)	3	(60.0)	1	(20.0)	1
Compliance								**0.013**
Yes	213	37	(17.4)	131	(61.5)	45	(21.1)	
No	33	4	(12.1)	28	(84.8)	1	(3.0)	

The majority of patients (42.5%) reported side effects from their treatment during their first follow-up visit. This proportion significantly varied over the study period (p = 0.029), decreasing from 42.5% at the first visit to 20.7% at the third visit. The most commonly reported side effects were burning sensations (44.6%) and itching (27.7%).

4. Discussion

Our study reported a hospital frequency of 5.6%. The frequency is higher in the general population, as found by Daniel *et al.* [3], who reported a global prevalence of 72% among school-aged populations in France. A predominance of female cases, with a sex ratio (M/F) of 0.4, was noted. This same female predominance

has been observed outside of Africa. For instance, in a study conducted in France by Seité *et al.* [4], 68% of the patients were women compared to 32% of men. This predominance of acne among women could be attributed to the fact that women are generally more concerned about their body image than men.

In this study, patients aged 18 to 24 years were the most represented (37.3%), followed by those aged 25 to 39 years (33.8%), while children and adolescents (ages 0 to 17) represented only 15.1%, confirming that acne is a young adult condition. However, several authors have noted that acne is primarily an adolescent disease [1] [5] [6]. The low proportion of adolescent patients in our study could be explained by the trivialization of acne by this population group, and it also confirms that acne patients tend to wait until their condition worsens before consulting a dermatologist in a hospital setting. Additionally, this difference may be explained by the fact that this is a hospital-based study, as acne is more frequently observed in younger populations in the general population. This assertion is further supported by over half (51%) of the patients in our study who admitted to having developed acne during adolescence. Indeed, teenagers in their pubertal phase are exposed to the effects of androgen dependency, particularly testosterone, which often makes their skin oily with a thick and uneven texture, promoting the onset of pubertal acne [6]. Acne can also result from the cosmetic use of dermocorticoids or greasy, comedogenic products [7] [8]. These cosmetic practices, particularly voluntary depigmentation, have greatly contributed to the frequency of acne among young adults.

Our study revealed that the vast majority (83.2%) of patients had already undergone some form of treatment before their admission to a specialized hospital department. This finding is similar to that of Yamontche [9], who reported that 76% of acne patients in Benin had attempted treatment before consulting at the hospital. Thus, acne patients tend to wait until their condition worsens or all other treatment attempts have failed before seeing a dermatologist for proper care.

In our study, sixty traditional products were applied by patients in their therapeutic itinerary. Among these products, lemon was the most commonly used (23.3%), followed by honey (11.1%), green clay (10.5%), aloe (7.9%), turmeric (7.8%), and tomato (5.4%). The extensive use of lemon (Citrus limon) highlights its anti-acne effects. El Alami *et al.* confirmed this in a study conducted in Morocco in 2018 [10]. Lemon (fruit and peel) contains essential oils with antibacterial properties that are effective in treating acne [10]. Other traditional products used by patients, such as aloe (leaves) and papaya (seeds and fruit), have also been found to be effective in acne treatment [10]. Moreover, the antibacterial efficacy of turmeric against *Cutibacterium acnes* as well as its antioxidant and anti-inflammatory effects in acne due to its curcumin content have been well documented in the literature [11] [12]. It also possesses skin-lightening properties [11], which could be useful in treating post-acne hyperpigmentation.

Drug combinations were mostly used by acne patients engaging in self-medication. The most common drug combination was one containing a corticosteroid,

an antibiotic, and an antifungal, used by 39.5% of patients, followed by a combination containing a corticosteroid, an antibiotic, an antifungal, and an antiprotozoal (33.3%). It is notable that corticosteroids were present in these formulations, as they possess anti-inflammatory and depigmenting properties [13]. While steroids initially suppress inflammatory papules and pustules, they become more resistant in case of recurrence, producing a clinical presentation of acne lesions induced by topical corticosteroids, which may be due to follicular system degradation [7] [14].

The management of acne in dermatology consultations is a prime example of the need to combine medication with dermo-cosmetics. The latter has seen considerable advancements, giving them a real place in treatment and adherence today [15]. Moreover, topical and systemic medications, which have pharmacological action and market authorization for acne treatment, often induce side effects such as dryness and irritation linked to the alteration of the skin barrier [15] [16]. Dermo-cosmetic products were therefore prescribed alongside anti-acne medications to ensure good adherence and tolerance while also improving the effectiveness of the prescribed treatment. This approach by dermatologists in managing acne was also reported by Guerrero in a study conducted in France [15]. Local medication included not only topical antibiotics but also non-antibiotic topicals. Non-antibiotic topicals were more commonly prescribed. These included tretinoin and benzoyl peroxide, which were prescribed to 50.3% and 45.7% of patients, respectively. Topical retinoids (tretinoin or adapalene) and benzoyl peroxide are the most recommended in acne treatment algorithms [17] [18]. Indeed, benzoyl peroxide and topical retinoids are recommended as monotherapy for mild acne (Grade 2) and in combination for moderate acne (Grade 3) [17]. They are also combined with topical antibiotics in inflammatory acne, not only to increase their effectiveness but also to limit resistance of *Cutibacterium acnes* to treatment [18] [19]. Tretinoin was prescribed as frequently as benzoyl peroxide. According to Attar *et al.* [20], tretinoin provided a better therapeutic response than adapalene in the treatment of Moroccan acne patients. This greater efficacy of tretinoin, coupled with the lack of availability of adapalene in Benin, may explain the high prescription rate of dermatologists in our study. Doxycycline was also heavily prescribed by dermatologists in this study. According to Pan *et al.*, in a study conducted in China [21], doxycycline and minocycline were the most prescribed antibiotics by dermatologists for acne treatment. Kircik [22] reported that doxycycline and minocycline had similar efficacy in treating moderate to severe inflammatory acne, but minocycline was less tolerated by patients due to its more pronounced gastrointestinal side effects and its unique ability to induce the production of autoantibodies. The results from these authors justify the preference of dermatologists for prescribing doxycycline over minocycline.

The most adherent patients in this study were those who regularly attended their follow-up visits. More than half (53.5%) were deemed adherent at all follow-up visits. A similar adherence rate of 52% was recorded in France by Seité *et al.*

[4]. The majority of non-adherent patients (70.2%) were non-adherent because they neglected their treatment. This neglect may be explained by either forgetfulness or frustration with the slow progress of the therapeutic response.

5. Conclusion

The majority of patients had used treatments for their acne before their consultation at the NUHC-HKM dermatology unit. Their therapeutic itinerary often involved self-medication or advice from various individuals, both healthcare professionals and non-professionals. Rigorous studies on the effectiveness of the different products used (especially traditional ones) during the therapeutic journey of acne patients would help broaden the therapeutic arsenal of hospital dermatologists and make anti-acne dermatological care more accessible to patients.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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