Vitiligo in North Western Nigeria: Clinical and Epidemiological Characteristics

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ABSTRACT

Background: Vitiligo is the most common acquired pigmentary skin disorder characterized by progressive loss of melanocytes. This disorder occurs worldwide with an estimated prevalence of 0.1%–2% in most populations.

Objective: To assess the clinical and epidemiological characteristics of vitiligo patients in north-western Nigeria.

Methodology: This was a descriptive cross-sectional study conducted on 77 adults with vitiligo attending the Dermatology clinic of a tertiary healthcare centre in Nigeria, over ten months period. Data was collected using a structured questionnaire and analyzed using appropriate statistical tests.

Results: The mean age of the patients was 38.97±13.82 and 45 (58.44%) were females. The mean age at first onset of vitiligo was 33.5 ±14.84 years. Fifty-two (67.5%) had their vitiligo lesions lasting for less than a year. The commonest site of lesion onset was the head and neck region observed in 55 (71.4%). A positive family history of vitiligo was reported in 29 (37.7%), with majority of these reporting vitiligo in first-degree relative 25 (86.2). The commonest form of vitiligo observed according to the pattern of distribution was generalized/vulgaris in 29 (37.7%), which was closely followed by acrofacial vitiligo in 23 (29.9%).

Conclusion: This study observed vitiligo to affect more females than males, with vitiligo vulgaris and acrofacial vitiligo being the most common forms in this study. Positive family history of vitiligo especially in first degree relatives was observed in a significant number of the study participants.

Keywords: Vitiligo, acrofacial, Nigeria, clinical, epidemiological, depigmenting

Le Vitiligo au Nord-Ouest du Nigéria: Caractéristiques Cliniques et Epidémiologiques

ABSTRAIT

Contexte: Le vitiligo est la maladie dépigmentaire acquise la plus courante, caractérisée par une perte progressive de mélanocytes. Ce trouble survient dans le monde entier avec une prévalence estimée de 0,1 % à 2 % dans la plupart des populations.

Objectif: Évaluer les caractéristiques cliniques et épidémiologiques des patients atteints de vitiligo dans le nord-ouest du Nigeria.

Méthodologie: Il s'agissait d'une étude transversale descriptive menée de 77 adultes atteints de vitiligo fréquentant la clinique de dermatologie d'un centre de soins de santé tertiaire au Nigeria, sur une période de dix mois. Les données ont été recueillies à l'aide d'un questionnaire structuré et analysées à l'aide de tests statistiques appropriés.

Le Résultats: L'âge moyen des patients était de 38,97 ± 13,82 et 45 (58,44 %) étaient des femmes. L'âge moyen au début du vitiligo était de 33,5 ± 14,84 ans. Cinquante-deux (67,5 %) avaient leurs lésions de vitiligo qui duraient moins d'un an. Le site le plus fréquent d'apparition des lésions était la région de la tête et du cou observée dans 55 (71,4 %). Des antécédents familiaux positifs de vitiligo ont été rapportés chez 29 (37,7 %), la majorité d'entre eux rapportant le vitiligo chez un parent au premier degré 25 (86,2). La forme de vitiligo la plus courante observée selon le schéma de distribution était généralisée/vulgaire chez 29 (37,7 %), suivie de près par le vitiligo acrofacial chez 23 (29,9 %).

Conclusion: Cette étude a observé que le vitiligo affectait plus de femmes que d'hommes, le vitiligo vulgaire et le vitiligo acrofacial étant les formes les plus courantes dans cette étude. Des histoires familiaux positifs de vitiligo, en particulier chez les parents au premier degré, ont été observés chez un nombre important de participants à l'étude.

Mots clés: Vitiligo, acrofacial, Nigéria, clinique, épidémiologique, dépigmentant

Introduction

Vitiligo is the most common acquired pigmentary skin disorder and is characterized by a progressive loss of melanocytes.[1] This disorder occurs worldwide with an estimated prevalence of 0.1%–2% in most populations.[2] Vitiligo usually begins in childhood or adolescence, with peak onset at 10 to 30 years, but it may occur at any age and both sexes are affected equally with no racial differences in the rate of occurence.[1,2] The prevalence appears to vary among different populations. A prevalence of 1.5% was reported in the USA, 2.28% in Romania, 1.13% in India, 0.51% in Iran.[3] In Africa a prevalence of 1.22% was reported in Egypt, and less than 0.17% in Ethiopia.[3] The prevalence of vitiligo in Nigeria ranges from 2.8% to 6.6% across different parts of the country.[4-7] Several theories have been advanced to explain the aetiopathogenesis of vitiligo. These include the autoimmune, auto-cytotoxic, biochemical, neural and genetic mechanisms.[2] However the exact cause remains unknown, though at present the autoimmune theory is the most acceptable.[2] This is due to the association of vitiligo with known autoimmune diseases like autoimmune thyroid diseases (Hashimoto thyroiditis and Graves' disease), type 1 diabetes mellitus (usually adult onset), pernicious anaemia and psoriasis.[2] Furthermore, the presence of organ specific auto-antibodies in affected individuals, as well as the presence of activated T-lymphocytes in the periphery of actively progressing vitiligo lesions support the autoimmune hypothesis.[8] Vitiligo is characterized by the presence of well-circumscribed, milky-white or chalk-white macules or patches on the skin and mucous membranes as a result of loss of functioning melanocytes at the involved areas.[1] Hair overlying a vitiligo lesion may also become white (leucotrichia).[9] This condition often demonstrates a predilection for sun exposed regions, body folds, and peri-orificial areas, although any part of the body can be affected.[10] Various precipitating factors have been suggested, including physical trauma to the skin, sunburn, psychological stress, inflammation, pregnancy, contraceptives, vitamin deficiency, and many others, even though no specific environmental triggers have been proven.[10] This study is aimed at documenting the clinicoepidemiological characteristics of patients with vitiligo in Zaria, north western Nigeria.

Subjects, Materials and Methods

This was a descriptive cross-sectional study of 77 adults with vitiligo attending the Dermatology clinic of a tertiary hospital in northern Nigeria between May 2019 and March 2020. Convenient sampling technique was used to enroll participants for the study as they presented to the clinic and fulfilled the inclusion criteria. After obtaining an informed consent from each participant, a well-structured interviewer administered questionnaire was used to collect the data. Information on the educational status and the job description of the participants was also obtained, and used for socioeconomic stratification using Oyedeji`s classification of high class (score 1-2), middle class (score 2.1-3) and lower class (score 3.1-5).[11] All participants were clinically examined by a consultant dermatologist. The diagnosis of vitiligo in this study was made on the basis of clinical findings of depigmented or hypopigmented lesions. In cases of uncertainty a skin biopsy was done to rule out other hypopigmentary lesions. For this study, vitiligo was classified in accordance with vitiligo global issues consensus conference (between 2011 and 2012).[12] This classified vitiligo as non-segmental, segmental and the unclassifiable/undetermined vitiligo which may be focal and mucosal affecting only one site.[12] The total surface area affected by the vitiligo lesions was estimated using the vitiligo calculator developed and validated by *Van geel et al.*[13] Vitiligo was further classified as active vitiligo when there was either expansion of existing lesions or appearance of new lesions in the last 6 months, and stable vitiligo when there was no expansion or appearance of new lesions.

Data entry and analysis

Data was analysed using Statistical Package for

Social Sciences IBM 20.0 (SPSS Chicago Inc., IL, and U.S.A.). The demographic parameters of the subjects were summarized using descriptive statistics. The Student's t-test was used to compare means for numeric variables and chi square test was used to test for association between categorical variables. All values were considered for statistical significance at $P<0.05$

Ethical considerations

Ethical approval was obtained from the Health Research and Ethics committee of a teaching hospital in Nigeria, with a protocol number HREC/M05/2019 before conducting the research. Written informed consent was obtained from each participating patient, after detailed explanation of the study had been given.

Results

Sociodemographic and clinical characteristics of the study participants

The study population consisted of 77 adults with vitiligo out of which 45 (58.44%) were females and 32 (41.56%) were males, giving a male to female ratio of 1:1.4. The mean age of the study participants was 38.97 ± 13.2 years while the modal age was 32 years (Table 1). Most of the study participants were married ~~46~~ (59.7%), while 24 (31.2%) were single. The educational attainment of the participants was postgraduate degree in 10.4%, first degree/higher national diploma in 26.0%, National Certificate in Education (NCE)/Diploma in 16.9%, secondary school certificate in 11.7%, primary school certificate in 10.4% and no formal education in 24.7%. The females are 21 times more likely not to have formal education than their males counterpart (likelihood ratio=21.36, p value= 0.001). More than two third of the participants 54 (70.1%) earn less than 18,000 naira monthly. Almost half of the study participants belong to the lower socioeconomic class, 37 (48.1%), with no statistically significant difference in terms of socioeconomic status between the two gender groups (x^2=1.214, p value= 0.545).

The age of first onset of vitiligo was between 24 and 42 years in 32 (41.6%) of the respondents, and mean age of first onset was 33.5 ±14.84 years. However, there is no statistically significant difference in the mean age of first onset between the two gender groups (t-test, p value= 0.844). Moreover, 52 (67.5%) have had their vitiligo lesions for less than a year with a median duration of 0.69 (IQR= 1.69) years. The commonest area of onset was the head and neck region observed in 55 (71.4%), followed by the lower limbs in 10 (12.9%) then the trunk in 8 (10.4%) as documented in Table 2. Vitiligo was symptomatic in some of the participants with pruritus in 33 (42.9%), pain in 19 (24.7%) and burning sensation in 21 (27.3%). Positive family history of vitiligo was reported in 29 (37.7%), with majority reporting vitiligo in their first degree relative 25 (86.2) Table 2. There was history of a precipitating factor in 12 (15.6%) of the subjects (acute illness in 10 (83.3%) participants and emotional stress in 2 (16.7%). Furthermore, majority 61 (79.2%) of the participants had prior treatment of their vitiligo before presentation with topical preparations being the most common agent, used by 57 (93.4%) patients. However, more than two thirds reported being unsatisfied by the prior topical treatment, 49 (63.6%). Two (2.6%) patients with vitiliginous lesions in covered sites only, 43 (55.8%) patients had lesions on exposed body parts only, and 32 (41.6%) patients had lesions involving both exposed and covered body parts (Table 2). Vitiligo was progressive in 42 (54.5%) of the subjects while 35 (45.5%) had stable disease.

The most common form of vitiligo observed according to pattern of distribution was generalized/vulgaris in 29 (37.7%) Fig.1, which was closely followed by acrofacial vitiligo in 23 (29.9%) Fig.2, mucosal (only one site) in 22 (26%) Fig.3, focal vitiligo in 3 (3.9%) Fig.3 and mixed type in 2 (2.6%) of the study participants. Non-segmental vitiligo was the most common clinical type observed in 52 (67.5%), followed by unclassified/undetermined vitiligo in 23 (29.9%) and segmental vitiligo in 2 (2.6%) of the participants. Trichrome vitiligo was observed in 46 (59.7%) of the study participants, and quadrichrome vitiligo was seen in 10 (13%) of the vitiligo participants Fig.4. Majority of the study participants had vitiligo affecting less than 10% of body surface area 66 (85.7%) Table 3. However, there was no significant difference observed between the extents of affectation in both gender groups. Koebner's phenomenon and leukotrichia were present in 24 (31.2%) and 29 (37.7%) of the participants Fig 4.

Discussion

Vitiligo is the most frequently observed acquired pigmentary disorder of the skin and mucous membrane resulting from selective loss of melanocytes.[1] The observation from this study of vitiligo being more common in adults in their third and fourth decades of life may be because adults in this age group are mostly engaged in social interactions and may become self-conscious of their appearance before their peers, thus they are more likely to present for care. Similarly, vitiligo being an autoimmune disease is more likely to be seen in young adults, perhaps due to the aggressive nature of the immune system at this age. The mean age of our study participants was similar to other studies.[7,14,15] Previous studies had reported vitiligo to affect both adults and children of both gender groups in equal proportion.[7,16-18] However, the female preponderance observed in this study may be attributed to the fact that women are more likely to present for treatment than men, possibly because of the greater psychosocial effect in affected women than ~~for~~ men. This finding is consisted with previous reports.[6,19-21] Although, a few similar studies have reported vitiligo to be more in males than females.[14,22]

From this study, the mean age of first onset of vitiligo was 33±14, this is similar to what was reported by Anaba *et al*[7] and Howitz *et al*.[23] The commonest reported age of onset of vitiligo is usually before age 30 years in up to 70–80% of patients, with most studies reporting half of patients have onset by age 20 years.[24,25] However, one epidemiological study has observed almost 50% of patients developing the disease after 40 years of age.[23] Childhood-onset of vitiligo (before age 12 years) is reported in up to 32–37% of patients.[27] When early onset is noted in children it may correlate with presence of family history of the disease.[24] Even though some studies had reported a difference in age of onset between the two gender groups,[23] this study did not observe any significant association of gender with age of onset.

The duration of the disease from this study ranges from five weeks to four and half years, with most patients having had the disease for less than one year. Vitiligo is a chronic disease with most patients presenting with long duration of lesions as a result of poor and unpredictable response to treatment. The relatively early presentation to hospital in our patients may be related to their level of education and awareness, in that majority of the study participants had at least primary school certificate. This is in keeping with most studies that reported vitiligo patients presenting to clinics within the first two years of onset of the disease.[7,19,20]

The head and neck region (especially the lips) were found to be the commonest site of onset of vitiligo in the majority of our patients, followed by the trunk then lower limbs. Vitiligo often demonstrates a predilection for sun exposed body parts like the face, body folds, and peri-orificial areas, although any part of the body can be affected. The head and neck region were the most common site of onset reported by many studies which is similar to what was observed in this study.[7,14,19,27,28] Some other studies however reported the lower limbs to be the most common site of onset due to predisposition to trauma.[21,29,30] Vitiligo vulgaris was the commonest clinical type observed in this study, followed by acrofacial and mucosal types. This is in keeping with various epidemiological reports of it being the commonest clinical variant, seen in one third to two third of patients.[19,20,24,29] However, Onunu *et al*.[6] and Anaba *et al*.[7] had reported focal and acrofacial vitiligo as the predominant types in their respective studies. Trichrome vitiligo observed in 59.7% of our study participants conforms to its reported prevalence of between 8% and 66.3% across different studies.[9,19,20,31,32]

Leukotrichia and Koebner's phenomenon (KP) were observed in one third of our participants, in keeping with findings from previous reports.[19,20,21] Leukotrichia is considered to be a poor prognostic factor in patients with vitiligo as a result of loss of melanocyte reserves in the hair bulb. In patients with vitiligo, KP may be responsible for the onset of the so-called isomorphic depigmented lesions that may correspond to traumatized areas (scratches).[12] Vitiligo lesions are commonly observed to be more prominent in skin areas exposed more to physical trauma compared with adjacent, more protected areas, such as metacarpophalangeal joints (versus between the joints), the nose tip and alae (versus nasal sulci), axilla and elbows.[12] Koebner phenomenon is classified into 3 based on its method of assessment, thus, it can be assessed by history, by

clinical examination, or by assessment of experimentally induced KP.[35] The presence or absence of KP is useful for guiding surgical therapeutic interventions in patients with vitiligo.[36] However, some authors have reported much lower rates of leukotrichia and Koebner's phenomenon in patients with vitiligo.[7,31,32]

Even though vitiligo is reported as a generally asymptomatic disease, some patients can present with one or more symptoms of itching, pain or sun burn,[37] as seen in our participants. Itching is the predominant symptom reported by our participants. Itching in vitiligo may results from xerosis and irritation of the exposed vitiliginous skin. This finding is not in keeping with the report by Anaba *et al.*[7] where most of their patients were asymptomatic.

Vitiligo lesions usually begin insidiously and commonly affect sun-exposed body parts, however certain factors such as skin trauma, sunburn, pregnancy, emotional stress allergens, chemicals, occupations, systemic illness, and diet may precipitate the disease with physical trauma being the most implicated factor both for onset of vitiligo and koebnerization over trauma-prone sites.[20,37,] In this study positive history of precipitating factors was observed in 15.5% with systemic illness being the commonest precipitant of vitiligo. The finding in this study of most of the patients having lesions on exposed body parts in keeping with similar studies.[7,19,21]

A positive family history of vitiligo was reported by 37.7% of our patients with majority of them reporting vitiligo in first degree relatives (86.2%). This is quite high, though within the commonly reported range of 2.7–38% by several other studies.[6,7,14,19,21,38,39] Some studies had shown vitiligo to be inherited in a non-Mendelian, multifactorial, and polygenic pattern of inheritance, with incomplete penetrance.[37] A positive family history of vitiligo is associated with poor prognosis.[40] The high rate of positive family history among our patients may be attributed to the high rate of consanguineous marriages in the study area.

A large percentage of the patients in this study had engaged in self-medication of their vitiligo lesions prior to presentation to our clinic. This may be because vitiligo is a cosmetically disfiguring disease that is more striking in dark skinned individuals, thus affected individuals are often talked about by their peers and given multiple suggestions of over the counter nonprescription drugs to use. Furthermore, in Nigeria over the counter drugs are readily accessible and most of them would have used one or more drugs before presenting to the hospital. This finding is similar to what was reported by Kiprono *et al.*[19] in Tanzania, where up to 81.1% of their patients had practiced self-medication. However, much lower rate of self-medication was reported by Anaba *et al.*[7] in south western Nigeria.

More than half of the patients had an active disease at presentation. This may be explained by the fact that vitiligo is a chronic and progressive disease with unpredictable response to treatment. This is further buttressed by the finding that more than two thirds of those who had prior treatment before presentation were unsatisfied by the treatment outcome. This finding is consistent with previous reports by Rheghu *et al*[21] and Kiprono *et al.*[19] where they reported progressive disease in 62.5% and 51.6% of their patients respectively.

From this study, the treatment modalities used by the patients can be divided into topical and systemic therapies. The most common treatment used was topical agents (topical corticosteroids and Psoralen UVA with sun exposure (PUVASOL) in 93.4% of them, this was followed by systemic agents (corticosteroids and PUVASOL) in 47.5%. This finding is in keeping with most of the studies that reported topical corticosteroids as the most commonly used treatment option.[7,21] The first-line therapeutic option for vitiligo entails the use of topical corticosteroids and calcineurin inhibitors.[26] Second-line therapy includes phototherapy using either narrow band ultraviolet light (NB-UVB) or psoralen and UVA (PUVA) and systemic corticosteroids.[26] Surgical therapeutic methods are usually employed in patients with segmental vitiligo and in those with stable non-segmental vitiligo for at least 1 year with poor response to medical interventions and absence of Koebner's phenomenon.[26]

In conclusion, this study showed that the clinical and epidemiological characteristics of vitiligo patients in north western Nigeria were similar to what is

obtainable in both local and international studies. This study observed vitiligo to affect more females than males, with a mean age of onset of the disease as 33±14 years. Vitiligo vulgaris and acrofacial vitiligo remain the most common forms with systemic illness and trauma the important precipitating factors in this study. Positive family history of vitiligo especially in first degree relatives was observed in a significant number of the study participants.

Acknowledgment

This research was financially supported by the Tertiary Education Trust Fund (TETFUND) institution-based research grant (IBR), with a Ref. no. DPM/TETFUND/01/12.

The authors declare no conflict of interest in the above findings.

Table 1: Sociodemographic characteristics of the study participants

Subjects characteristics	**Gender**		**Total study population n=77**	**P value**
Age groups (years)	**Males n=32 (%)**	**Females n=45 (%)**		
18-27	6 (18.8%)	11 (24.4%)	17 (22.1%)	
28-37	14 (43.8%)	11 (24.4%)	25 (32.5%)	
38-47	3 (9.4%)	9 (20.0%)	12 (15.6%)	
48-57	7 (21.9%)	8 (17.8%)	15 (19.5%)	
58-67	2 (6.2%)	6 (13.3%)	8 (10.4%)	
Mean age ±SD	38.25±13.12	39.49±14.43	38.97±13.82	0.701
Occupation				
Business	8 (25.0%)	4 (8.9%)	12 (15.6%)	
Subsistence farmer	7 (21.9%)	0 (%)	7 (9.1%)	0.001
Household work	0 (%)	10 (22.2%)	10 (13.0%)	
Artisan	2 (6.2%)	7 (15.6%)	9 (11.7%)	
Unskilled laborer	2 (6.2%)	2 (4.4%)	4 (5.2%)	
Civil servants	7 (21.9%)	12 (26.7%)	19 (24.7%)	
Unemployed	6 (18.8%)	10 (22.2%)	16 (20.8%)	
Ethnicity				
Hausa	25 (78.1%)	28 (62.2%)	53 (68.8%)	
Yoruba	0 (%)	5 (11.1%)	5 (6.5%)	0.044
Others	7 (21.9%)	12 (26.7%)	19 (24.7%)	
Education attainment				
Upper class	**8 (25.0%)**	**10 (22.2%)**	**18 (23.4%)**	**0.539**
Middle class	7 (21.9%)	15 (33.3%)	22 (28.6%)	
Lower class	17 (53.1%)	20 (44.4%)	37 (48.1%)	

Table 2: Clinical characteristics of the vitiligo patients

Duration of vitiligo lesions	Frequency (%)
<1 year	52 (67.5%)
1-4 years	21 (27.3%)
> 4 years	4 (5.2%)
Mean duration ±SD (weeks)	48.94±47.31
Age of first onset (years)	
5-23	22 (28.6%)
24-42	32 (41.6%)
43-61	21 (27.3%)
>61	2 (2.6%)
Mean age of first onset ±SD	33.50±14.82
Site of onset of vitiligo	
Head and neck	55 (71.4%)
Upper limbs	4 (5.2%)
Lower limbs	10 (12.9%)
Trunk	8 (10.4%)
Affected anatomical sites	
Head and neck	74 (96.1%)
Upper limbs	38 (49.4%)
Lower limbs	42 (54.5%)
Trunk	33 (42.9%)
Perineum/genitalia	19 (24.7%)
Clinical type of vitiligo	
Non segmental vitiligo	52 (67.5%)
Prior treatment of vitiligo	**61 (79.2%)**
Leucotrichia	**29 (37.7%)**
Koebner's phenomenon	**24 (31.2%)**

Table 3: Body surface area affected by vitiligo in the study participants

Body surface area affected (%)	Males n=32	Females n=45	Total population N=77	P value
< 10	26 (81.3%)	40 (88.9%)	66 (85.7%)	0.183
10–20	4 (12.5%)	1 (2.2%)	5 (6.5%)	
>20	2 (6.2%)	4 (8.9%)	6 (7.8%)	

Fig 1: showing depigmented patches of vitiligo vulgaris

Fig.3a: Showing mucosal vitiligo, **3b:** Trichrome vitiligo and **3c:** Focal vitiligo.

Fig.2: Showing acrofacial vitiligo

Fig.4a: Showing a segmental vitiligo, Trichrome and **4b:** leucotrichia

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