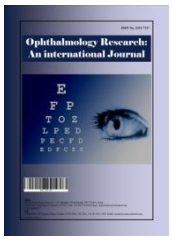

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# Evaluation of Ocular Findings in Vitiligo

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***Authors' contributions***

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## ABSTRACT

Vitiligo is a pigmentary disorder of the skin and mucous membranes with worldwide incidence of 0.5-2%. The aim of this cross sectional study was to assess the ocular involvement in vitiligo patients. Two hundred patients clinically diagnosed vitiligo attending vitiligo clinic, dermatology department, Jomhorya hospital, Benghazi-Libya over a period of 6 months enrolled in this cross-sectional study. All patients were exposed to detailed disease history and thorough dermatological examination. Out of the total cases, 100 patients had a standard Ophthalmologic examination in cooperation with an ophthalmologist in Benghazi eye hospital. Results of our study showed a slightly higher prevalence of vitiligo in females (male: female ratio 1:2.8). The mean age of onset for males was 22.4 years and for females 24.8 years and 58.5% of patients develop vitiligo below 20 years of age. Generalized vitiligo was the commonest clinical type of vitiligo (57.5%). The relationship between the duration of the disease and its type was statistically significant ($P<0.05$), there was also a significant relationship between the type of vitiligo and its severity ($P< 0.01$). Sixteen patients (8%) had segmental vitiligo and the face was the common site involved. The lower limbs were the most commonly affected sites of the body (57%). Ocular changes were seen in 40% of patients and specific ocular abnormalities like uveitis, iritis, and iris and retinal pigmentary abnormalities are present in 15% of patients, nonspecific ocular abnormalities were present in 33% of patients. There was no statistically significant correlation between specific ocular abnormalities, severity and duration of vitiligo.

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*Keywords: Vitiligo; segmental vitiligo; autoimmune; uveitis.*

## 1. INTRODUCTION

Vitiligo is a common, acquired autoimmune disorder presented by milky white macules and patches. It is a relatively common disease and studies have demonstrated an incidence of 0.14% to 8.8% (the likely incidence is between 0.5-2%) [1,2]. A positive family history of vitiligo was elicited in 25% of patients.The disease affects all races and both sexes equally; the higher female prevalence can be attributed to greater concern about cosmetic effects [1]. It appears to be more commonly observed in sunexposed areas and in darker skin types. About 85 % of patients well and only 15% sunburn in constitutively normal skin [2,3]. Vitiligo may develop at any age; onset has been reported from birth to 81 years of age. Congenital vitiligo is very rare and the peak age of onset was between l0 and 30 years; in 50% of cases, the age of onset fell within the first two decades of life [1,3,4]. Vitiligo patients normally have no ophthalmologic complaints, but may have iris and retinal pigmentary abnormalities, choroidal abnormalities and iritis [5,6]. Uveitis also rarely occurs but visual acuity is normally unaffected [7]. The aim of the study is to justify some epidemiologic data of vitiligo and to assess the ocular involvement and its relation to the disease severity.

## 2. PATIENTS AND METHODS

Two hundred patients of clinically diagnosed vitiligo of both sexes and different clinical types, attending vitiligo clinic, dermatology department, Jomhorya hospital, Benghazi-Libya over a period of six months. All patients included in this study were exposed to detailed disease history and thorough dermatological examination according to the prepared Performa. Out of 200 patients included in this study, 100 patients had a standard ophthalmologic examination including the visual acuity, examination of the anterior segment of the eye Slit lamp and examination of the ocular fundi by ophthalmoscope in cooperation with an ophthalmologist in Benghazi central eye hospital. Statistical analysis was performed using SPSS for Windows (version 0.9). The significance of observed associations and / or differences between variables was tested using Pearson correlation coefficient. A difference was considered to be statistically significant if $P<0.05$ and $P<0.01$.

## 3. RESULTS

**Dermatological Findings:** Out of 200 vitiligo cases, 53 were males (27%) and 147 (73%) were females, with male to female ratio 1: 2.8 .The patient's age ranged from 1-75 years, the mean age being 28.6 years. The mean age of onset for males was 22.4 years and for females was 24.8 years. The earliest age at onset in a neonatal period (one case) and the oldest was 75 years, with a mean age of onset 21.2 years, and 58.5% of our patients develop vitiligo below 20 years of age. Females were predominantly involved in all age groups. In 93 patients (46.5%) the duration of the disease was 1-5 years, whereas in 69 patients (34.5%) the duration was >5 years. Ninety-one patients (45.5%) showed mild vitiligo, and in 46.5% of patient, the duration of the disease was ranging from 1-5 years, 27% of them showed mild form of the disease (Table 1). There was significant correlation between the duration of the disease and its severity ($P< 0.01$). Vitiligo was predominantly nonsegmental (92%). Generalized vitiligo (57.5%) was the commonest clinical type in our study (Fig. 1) (Fig. 2) whereas segmental vitiligo was seen in 16 patients (8%) (Fig.3). The relationship between the duration of the disease and its type, was statistically significant ($P<0.05$), there was also significant relationship between the type of vitiligo and its severity ($P< 0.01$).

**Ocular Findings:** Out of the total vitiligo patients, 100 patients had a complete ocular examination, and our results showed that 40 patients (40%) had eye manifestations. Nonspecific ocular abnormalities like visual acuity defects, cataract, allergic conjunctivitis, dacryocystitis, and diabetic retinopathy were present in 33 patients (Table 2). Fifteen patients (15%), 13 females and 2 males had specific ocular abnormalities like uveitis, iritis, and iris and retinal pigmentary abnormalities (Figs. 2, 3). Out of these 15 patients, 7 patients had generalized vitiligo, 7 patients had localized vitiligo and one patient had vitiligo universalis, this difference was statistically non significance ($P > 0.01$).The duration of the disease in patients with specific ocular abnormalities ranged from one month-21 years (mean 6 years). There was no statistically significance correlation between ocular abnormalities and the duration of the disease as 8 patients out of 15 patients having vitiligo for $< 5$ years and 7 patients for $\geq 5$ years had specific ocular abnormalities ($P > 0.01$)

(Table 3). Out of 15 patients who had specific ocular abnormalities, only 3 patients had severe vitiligo and eight patients had moderate vitiligo in which there was no statistically significance correlation between specific ocular abnormalities and the disease severity (P > 0.01) (Table 3).

**Table 1. The relationship between the duration of the disease and its severity**

| Duration | Severity: No. of patients (%) | | | |
|---|---|---|---|---|
| | Mild | Moderate | Severe | Total |
| Less than 1 year | 22 (11%) | 14(%7) | 2(%1) | 38 (19%) |
| Between 1-5 years | 54 (27%) | 26 (13%) | 13 (6.5%) | 93 (46.5%) |
| More than 5 years | 15 (7.5%) | 37 (18.5%) | 17 (8.5%) | 69 (34.5%) |
| Total | 91 (45.5%) | 77 (38.5%) | 32 (16%) | 200 (100%) |

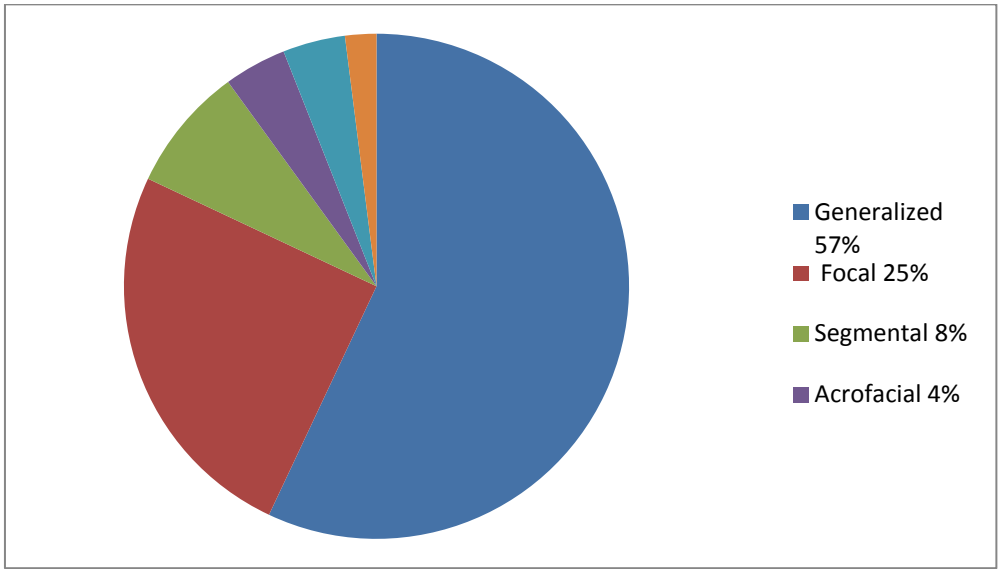


**Fig. 1. Clinical types of vitiligo**

**Table 2. The specific and nonspecific ocular abnormalities observed in 100 patients**

| The ocular abnormality | No. of patients (%) |
|---|---|
| Fundal pigmentary changes | 12 (12%) |
| Uveitis | 2 (2%) |
| Retinal detachment | 1 (1%) |
| Iritis | 1 (1%) |
| Chorioretinal degeneration | 1 (1%) |
| Visual acuity defects | 26 (26%) |
| Cataract | 8 (8%) |
| Allergic conjunctivitis | 6 (6%) |
| Diabetic retinopathy | 4 (4%) |
| Dacryocystitis | 2 (2%) |

**Table 3. The duration and severity of the disease in 15 patients with specific ocular abnormalities**

| Duration | No. of patients | Severity | | |
|---|---|---|---|---|
| | | Mild | Moderate | Severe |
| < 5 years | 8 (53.3%) | 2 (13.3%) | 5 (33.3%) | 1(6.7%) |
| 》 5 years | 7 (46.7%) | 2 (13.3%) | 3 (20%) | 2 (13.3%) |
| Total | 15 (100%) | 4 (26.6%) | 8 (53.3%) | 3 (20%) |

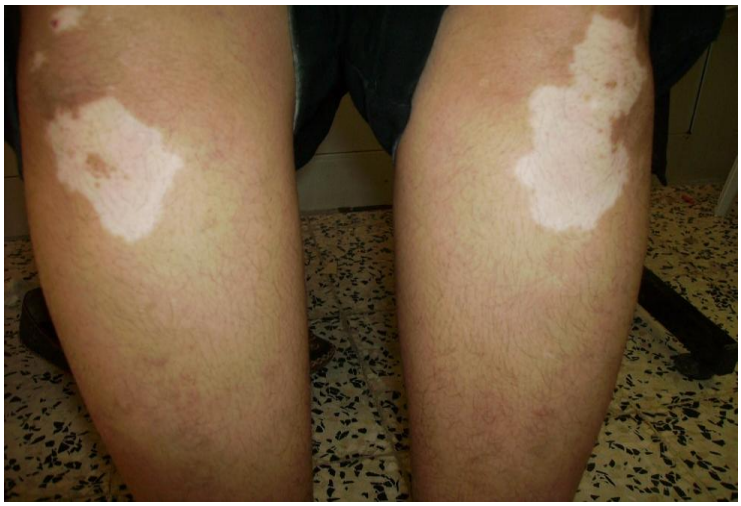

**Fig. 2. Generalized vitiligo with involvement of the lower limbs**

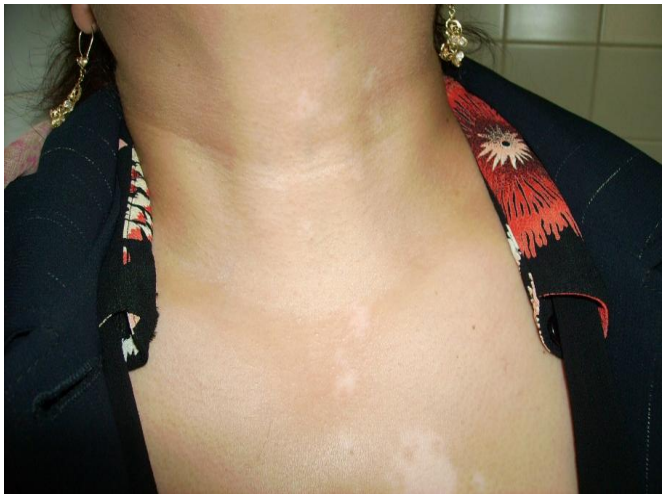

**Fig. 3. Segmental vitiligo**

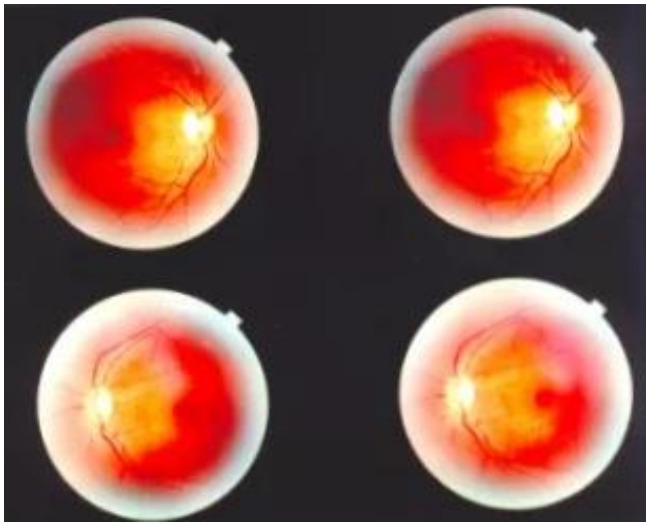

**Fig. 4. Slightly hyperpigmented macula, left eye more than right**

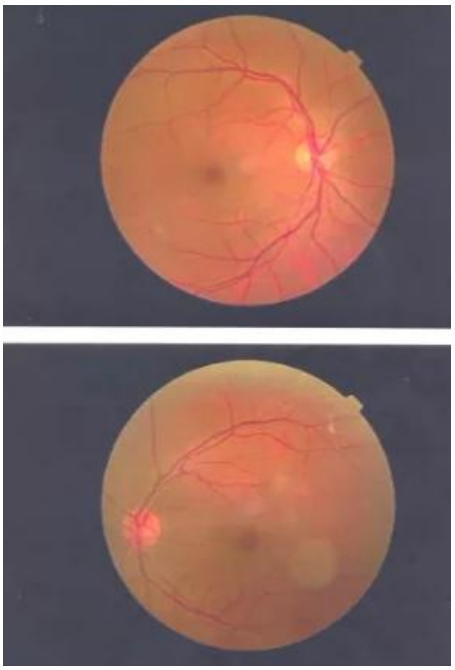

**Fig. 5. Mild hyperpigmentation at the macula**

## 4. DISCUSSION

Vitiligo is a pigmentary disease clinically presented by depigmented skin macules due and patches to the chronic and progressive loss of melanocytes from of cutaneous epidermis [1,2,8]. Currently, the exact aetiology of vitiligo remains obscure, but many factors have been implicated in the development of the disease including infections, stress, neural abnormalities, melatonin receptor dysfunction, impaired melanocytes migration and genetic susceptibility [9]. Many studies have indicated a role for both cellular and humoral immunity in the pathogenesis of vitiligo [10]. The most convincing evidence of an autoimmune is the presence of circulating antibodies against melanocyte proteins in patients with vitiligo [11]. In addition to humoral immune mechanisms, strong evidence indicates involvement of cellular immunity. Destruction of melanocytes may be directly mediated by autoreactive $CD8^+$ T cells. Activated $CD8^+$ T cells have been demonstrated in perilesional vitiligo skin [12,13]. Vitiligo is characterized by incomplete penetrance, multiple susceptibility loci, and genetic heterogeneity [14]. Family and twin studies have shown that inheritance is complex and likely involves both genetic and environmental factors [15]. Additionally, it is believed that genetic factors may influence the age of onset of vitiligo [16]. The inheritance of vitiligo may include genes associated with the biosynthesis of melanin, a response to oxidative stress, and regulation of autoimmunity [1]. A positive family history of vitiligo in this study was elicited in 25% of patients. Both sexes are likely affected equally; the female prevalence in some studies can be attributed to greater concern about a cosmetic defect. On comparing our clinical observations with previous reports we found a slightly higher prevalence of vitiligo in female (male: female ratio 1: 2.8). Vitiligo may develop at any age; onset has been reported from birth to 81 years. The peak age of onset in all series was between 10 and 30 years; in 50% of cases, the age of onset fell within the first two decades of life [3]. The mean age at present was 28.6 years; this is in agreement with previous studies [17,18], where the mean age was 23 years. Lerner observed that nearly 50% of vitiligo developed below 20 years of age [2], while it was slightly higher (58.5%) in our series and much higher (61.9%) in a previous study [19] this may reflect cosmetic disfigurement of this age group and parental anxiety leading to early reporting. Vitiligo was predominantly non-segmental in 92% of our patients. Generalized vitiligo (57.5%) was commonest type, this supports the finding of a previous study [17]. This indicates that the process of depigmentation (either immune mediated \ toxic) may occur simultaneously or subsequently at various unrelated distant sites. Segmental vitiligo is characterized by unilateral macules in a dermatomal or quasi-dermatomal distribution. This should be considered a special

type of vitiligo that has a stable course and is unlikely to be associated with thyroid disease or with other vitiligo-associated diseases. Five percent of adults but more than 20% of children with vitiligo are found to have this pattern. In various studies, from 5 to 28% of patients have been noted to have a segmental pattern. In our study 16 patients (8%) had segmental vitiligo. The most common site of involvement was the face (7 patients). The trigeminal was the most commonly involved dermatome, these finding support the findings of a previous study [20]. As we can see in our series the mucosa is affected in 31% of patients, this is slightly lower than another study where it was found 59.3% [19]. Since melanocytes are distributed not only in the skin but also in the eyes, the mechanism responsible for melanocytes destruction in the skin affect melanocytes at other locations as well. Vitiligo patients normally have no ophthalmologic complaints but may have iris and retinal pigmentary abnormalities. Careful examination has revealed choroidal abnormalities in up to 30 % and evidence of iritis in 5% [21]. In our study, specific ocular abnormalities occurred in 15% of vitiligo patients. Many authors reported similar ocular changes in vitiligo patients [18,22]. But these ocular findings may be observed in as many as 66% of patients with vitiligo [23,24]. In our study these ocular findings include: Fundal pigmentary changes (12%), uveitis (2%), iritis (1%), and Chorioretinal degeneration (1%), this is much less than other studies [25,26]. Uveitis has been reported in 4.8–19% of patients with vitiligo. Wagoner et al. suggested that periocular skin depigmentation is a frequent abnormality in patients with ocular findings [27]. Baskan et al. reported that ocular findings are primarily associated with periorbital and, to a lesser extent, genital vitiligo [28]. Pai et al. found that iris and fundus changes were maximum in cases with lesions located on the face, and angle changes were more significant in cases with genital vitiligo [29]. Gopal et al. [18] found that 19.8% of generalized vitiligo and 9.8% with localized vitiligo had ocular abnormalities, this difference being statistically significant, they also found that there was no statistically significant correlation between ocular abnormalities and the duration of the disease. In our study 7% of patients with specific ocular abnormalities had generalized vitiligo, 7% with localized vitiligo and 1% with vitiligo universalis. this difference was statistically non significant. In our study there was no statistically significant correlation between ocular abnormalities and the duration and severity of the disease. In present study non specific ocular abnormalities were present in 33 vitiligo patients, while 35 of vitiligo patients in other study had non-specific ocular abnormalities [18,26,30].

## 5. CONCLUSION

The frequency of vitiligo in our study was higher in females than males (2.8:1). Nonsegmental vitiligo constitutes 92% of our vitiligo patients. Generalized vitiligo was the commonest clinical type. Out of hundred cases that had complete ophthalmological examination, 40% had eye changes. In 15 patients (15%) specific ocular abnormalities including iritis, uveitis, chorioretinal degeneration, and fundal pigmentary changes had occured. There was no statistically significant correlation between specific ocular abnormalities and the disease severity and duration. To the best of our knowledge this is the first to be reported from Libya and North Africa.

## CONSENT

All patients signed an informed consent form before participating in the study.

## ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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