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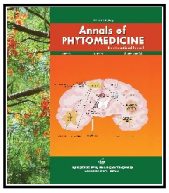

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Epidemiological study of patients with vitiligo at NRIUM-SD: A population based study

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Abstract

Vitiligo (baras) is a common skin disorder in which there is loss of pigmentation due to destruction of melanocytes. The prevalence of vitiligo worldwide ranges from 0.1 to 2%, and the range differs from country-to-country. In India, the prevalence ranges from 0.46 to 8.8%. Most of the studies have shown that the prevalence of vitiligo does not associate with gender. Higher incidence of onset of disease is below 30 years. Some cases show family history of vitiligo. It may sometimes associate with other autoimmune diseases. The literature is collected from classical Unani textbooks, textbooks of dermatology, and online databases using several keywords. The number of patients screened for an year from the outpatient department (OPD) of National Research Institute of Unani Medicine for Skin Disorders (NRIUM-SD), Hyderabad which is specialised institute for skin disorders particularly vitiligo. This article summarises the prevalence and incidence of vitiligo related to age, onset of disease, gender, family history, segmented/ non-segmented type, and site of maximum appearance.

1. Introduction

Vitiligo is a cutaneous pigmentary disorder characterised by a gradual, patchy loss of skin colour and is brought on by the selective destruction of melanocytes (Choi *et al*., 2014). Vitiligo was first mentioned in Vedic and Egyptian manuscripts about 3000 years ago (Millington and Levell, 2017). In Unani system of medicine, vitiligo is known as baras. Other names are Safed Daagh, Safed Kodh, Phuleri and Savitra (Anonymous, 2013). 'Baras' is an arabic term which means white skin. Vitiligo is derived from latin word 'vitium' which means 'defect' or 'blemish'. Vitiligo is the most prevalent pigmentary disorder. It is neither infectious nor communicable yet a social stigma. Vitiligo is a dermatological and cosmetic condition affecting 1% to 2% of the population worldwide. It may run in families and may associate with other autoimmune, cutaneous and systemic disorders such as, alopecia areata, autoimmune thyroiditis, psoriasis, lichen planus, autoimmune hepatitis (Innes and Maxwel, 2016; Kane *et al*., 2015). This localised loss of pigmentation due to melanocyte destruction is considered to be mediated by an immune mechanism. These are circumscribed ivory or chalky white macules that are flush with the skin surface (Sehgal, 2004). Although, vitiligo can affect any area of the skin, it is more common on the hands, face, genitalia, and the area around orifices. Vitiligo may cause due to friction over the areas such as the elbows, ankles, and neck, which is known as the Koebner's phenomenon (Gauthier *et al*., 2003). The illness has a negative impact on the patient's quality of life in the long run as well as their self-worth and social standing. The depigmented patches may appear on any part of the body and get larger over time and put the patient through a lot of psychological stress.

1.1 Unani system of medicine

Ancient Unani scholars classified vitiligo (baras) as a skin condition. The aetiology has been characterised in a variety of ways by unani scholars. Various prominent physicians had presented a detailed explanation of vitiligo in the Unani system of medicine.

Rabban Tabarî (810-895 AD) in his renowned book Firdaus al-$ikma described impairment of blood (fasâd al-dam) and coldness of blood (burûdat al-dam) are the main causes of vitiligo. If, the food is not digested properly, then the blood gets impure. If, this impurity happens due to phlegm (balgham) or coldness, vitiligo appears (Tabari, YNM).

Galen (Jâlînûs 130-200 AD) as well as Avicenna (Ibn Sîna 980-1037 AD) in his medical encyclopaedia, Al-Qânûn fi'llibb says, the force known as ''tashbîh" which transforms nutrients into the shape of tissue, is one of the contributing factors. According to the features of that specific tissue, such as its consistency, colour, *etc*., this shaping is absolutely ideal in normal conditions. Sometimes the metabolism (ghazia) is out of whack that leads to vitiligo (baras or bahaq). In both cases, the nutritious material entering the tissues, is retained there, but fails to adopt the right form because of weakness of shaping power (qûwat-i-mughayirra) (Ibn Sina, 1352). The

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debility of these powers is due to impurities (mâdda-i ghalî"), *i.e.*, hoarded in the affected area. Therefore, the nutrients that dived at the affected area through blood circulation get malformed and when these nutrients become the part of organ, its normal appearance is altered due to weak transformative faculty (qûwat-i mushabbiha) (Khan, 1983). The Du'af (weakness) of these abilities may lead to vitiligo, which is said to be caused by accumulation of Balgham-i Ghalîz (viscous phlegm), Fasâal-Dam, or Barûdat al-Dam, in the body. (Tabri, 1997; Jurjani, 2010; Arzani, YNM). This concept has also been mentioned in Al-Mu'âlajat al-Buqrâmiya (Tabri, 1997) and Standard Unani Medical Terminology (Anonymous, 2012).

Zakariyya Râzî [865-925 AD] in his famous book, Kitâb al-Hâwî, describes vitiligo in detail. He said that if the affected skin turns red after rubbing, vitiligo is treatable, but if a whitish fluid comes out after pricking the depigmented skin, vitiligo is unlikely to treat. Râzî also said that after external application, exposure to sunshine triggers the pigmentation process (Razi, 1970).

Ibn-e-Hubul (1122-1213 AD) in his famous book Kitab al-Mukhtârât describes that in Barac, the colour of skin becomes as white as of Balgham and the main cause is derangement of cold-wet temperament (su»-i mizâj barid wa ramab) and accumulation of viscous phlegm (balgham-i ghalî") in the affected area.

A.H. Jurjânî (12th Century AD): Portrayed vitiligo in his book Dhakhîrâ Khawâr"am Shâhî in the same way as Ibn Sina did (Azam-Khan, 1885).

There are many treatment options for vitiligo in Unani system, such as Sufuf-e-Baras orally, Oral administration of 4.5 g. of the following majoon followed by exposure to sun rays may be done. Aqarqarah (*Anacyclus pyrethrum*), Atrilal (*Ammi majus*), Post-i-Bekh-i-Kibr (*Root bark of Capparis spinosa*), Shitraj Hindi (*Satureja hortensis*) each 7 g Honey Q.S., Vinegar Q.S.

Any of the following drugs may be used for local application Zimad-i- Baras, Roghan-i- Balsan, Roghan -i- Sudab, Roghan-i- Behroza, Roghan-i- Babchi, Roghan-i- Baiza-i-Murgh. "Treat Bars in its early stage and Bahaq by applying the medicine on the patches and exposing the patient (patches) to sun rays.

2. Incidence and prevalence

The incidence of dermatology outdoor patients in India is estimated to be between 3 and 4% (Dutta and Mandal, 1969). The incidence of vitiligo can range from 2.9% in Goa to 8.8% in Delhi, according to multiple workers in various locations around India. However, most experts estimate that it affects more than 4% of the population, which is much more than the 1% global population. Most countries have a prevalence of 0.5% to 1%, although some parts of India have a prevalence of above 8% (James *et al*., 2016). In different populations, vitiligo can range from 0.38 to 1.78% (Warrell *et al*., 2010). About 20-30% of cases have a familial incidence (Kane *et al*., 2015). The frequency rises with age (0.5%) among infants under 1 year of age, 1% among children aged 1 to 5, and 2.1% among children aged 5 to 12 years (Alikhan *et al*., 2011). Worldwide, vitiligo is estimated to affect 0.1-2% of the population. In India, the prevalence is closer to 0.5-2.5% (range: 0.46-8.8%) (Howitz, 1977; Alkhateeb *et al*., 2002). Vitiligo usually appears in childhood or early adulthood, peaking between the ages of 10 and 30. Nearly 50 per cent of instances were said to manifest before the age of 20, and 70 to 80 per cent before the age of 30 (Yaghoobi *et al*., 2011; Sehgal and Srivastava, 2007). Vitiligo affects both sexes equally (Warrell *et al*., 2010).

2.1 Types of vitiligo

According to Ahmad bin Rabban Tabrî an author of Mu»âlajât-i Buqrâmiyya, there are two types of vitiligo. The Barac-i- Muntashir affects the lesion site completely. It may extend up to the bone's surface or even within it, treatment for this is difficult. The lesion in the second kind of vitiligo is limited to the skin and bones. It is possible to treat it (Tabri, 1997).

According to Akbar Arzânî a kind of vitiligo known as generalised vitiligo (barac-i- muntashir) is caused by weakening of the shaping power (qûwat-i- mughayirra). If, it becomes chronic and continues to spread, treatment becomes challenging (Arzani, YNM).

The Vitiligo Global Issues Consensus Conference (VGICC), held in 2011 in Bordeaux, resulted in a consensus on vitiligo classification and nomenclature (Ezzedine *et al*., 2012). The two main categories are shown in as non-segmental vitiligo and segmental vitiligo (Bolognia *et al*., 2015).

Non-segmental vitiligo: This type of vitiligo is characterised by asymptomatic, well circumscribed, round to oval-shaped white patches on both sides of the body that vary in size. Non-segmental vitiligo, which makes up 85-90% of cases, is the most common kind (Taieb and Picardo, 2009). Between 50% and 90% of people have been reported to have nonsegmental vitiligo. The most common sites are the face (39.0 per cent), anterior trunk (23.6 per cent), neck (10.4 per cent), and posterior neck (9.1 per cent) (Hann *et al*., 1997).

Acrofacial vitiligo: The distal regions of the extremities (hands rather than feet) and facial orifices exhibit a circular pattern of depigmentation in acrofacial vitiligo (Kovacs, 1998). The body surfaces nearest to the initial sites typically exhibit the highest rates of progression. When vitiligo first appears on the hands, it most frequently progresses to the face (Hann *et al*., 2000). Furthermore, because mucosal lesions are linked to acrofacial lesions, mucosal vitiligo has been suggested as a subtype of acrofacial vitiligo (McHepange, 2010)**.**

Generalised vitiligo: Generalized vitiligo is characterised by symmetrical, well-circumscribed milky-white macules on both sides of the body that are asymptomatic (Arata and Abe-Matsuura, 1994). Individual macules can be circular or oval in shape, with margins that are either lightly brushed or well defined. Patients frequently report that their hands, faces, and fingers are sites where vitiligo first appears. Acrofacial vitiligo is common in these persons because vitiligo typically begins in the hands and progresses to the face (Chun and Hann, 1997). The most prevalent type of generalised vitiligo, vitiligo vulgaris, is characterised by a symmetrical distribution of achromic patches on the body (Le Poole, 2006). 41% of patients in the largest patient series (from China) had vitiligo vulgaris (Liu *et al*., 2005).

Universal vitiligo: The most extensive type of vitiligo is this one. There is no specific evidence for Universal vitiligo, despite some minor variations in vitiligo occurrence among various groups. Individuals with dark skin are more likely to experience vitiligo

universally. Comparing fair-skinned Caucasians to Asians or Africans, both populations exhibit universal vitiligo exposure. Although, vitiligo exposure can happen at any age, it is quite rare in young children. In universal vitiligo, almost the entire skin becomes depigmented. In areas exposed to the sun, a little amount of perifollicular, solitary, or coalescent pigmentation can appear. The areolae and genitalia may depigment early or late in the course of the sickness Leucotrichia (Depigmented body hair) is common in afflicted areas.

Mucosal vitiligo: Mucosae can be partially or completely depigmented, particularly the lips, gums, and genitalia (Hann and Nordlund, 2000).

Mixed: Mixed type vitiligo refers to the coexistence of non-segmental and segmental vitiligo. Mulekar *et al.* (2006) used the name "mixed vitiligo" to describe this kind of vitiligo. Non-segmental vitiligo generally precedes segmental vitiligo by 6 to 24 months, and segmental vitiligo is more resistant to therapy than non-segmental vitiligo (Happle, 2001; Ezzedine *et al.*, 2011). The appearance of halo nevi and leukotrichia at the start of the mucosal vitiligo on the perioral region might be risk factors. From segmental vitiligo to mixed vitiligo, there is a progression.

Segmental vitiligo: It can be uni or bi segmental, a quasidermatomal pattern of one or more macules. Segmental vitiligo can follow a blaschko linear distribution or not follow any lines at all, including Blaschko's lines and acupuncture lines (Lee *et al.*, 2007).

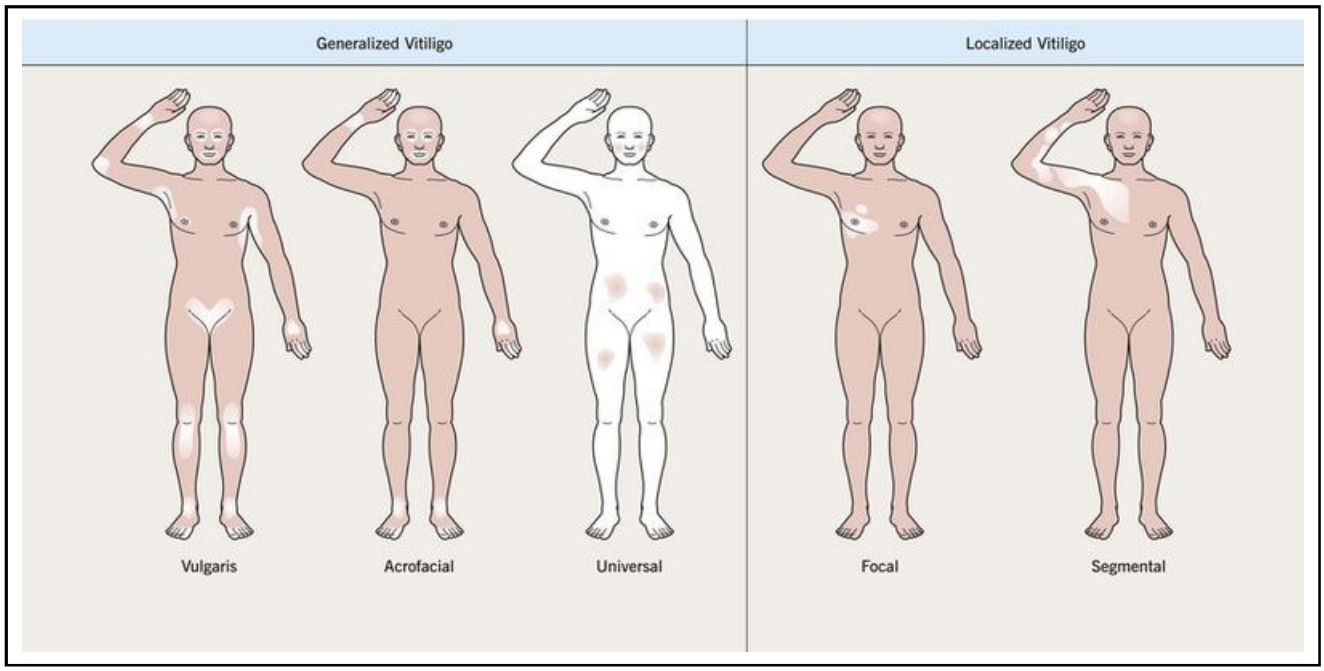

Figure 1: Clinical patterns of vitiligo.

2.2 Clinical features of vitiligo

Vitiligo (barac) is a well-circumscribed, depigmented milky white macule that can range in size from a few millimetres to several centimetres in diameter and is often undetected by the patient. Lesions may appear anywhere on the body, but they are more common where there is a lot of strain and pressure. As a result of Koebner's phenomenon, vitiligo lesions can appear in regions that have been exposed to stress or friction. Both sides of the body with a symmetrical pattern are generally affected in generalised vitiligo. Usually, the macules are round to oval in shape with slightly distinct margins due to hyperpigmentation on the margin (Passeron and Ortonne, 2010).

Sometimes, depigmented areas coexist with hypopigmented and normal colour within a vitiligo lesion. To describe this pattern term, 'trichrome vitiligo' commonly used, but this type of hypopigmentation can be observed in various degree leading to trichrome, quadrichrome or pentachrome vitiligo (Fargnoli and Bolognia, 1995). Thus, a single term "multichrome vitiligo'' preferred to describe this type of patterns (Passeron and Ortonne, 2010).

Hair is typically unaffected by vitiligo and remains pigmented, but in certain situations, it might turn grey or whitish. For example, localised whitening of the scalp and eyebrows usually results in localised depigmentation of hair, although entire whitening of the scalp hair can occur in rare circumstances. Since antiquity, depigmented body hair inside vitiligo lesions has been regarded as a poor indication of regimentation. Vitiligo patches are easier to spot on patients with darker skin than on those with very light skin. Wood's lamp examination, on the other hand, is highly useful in determining the areas implicated in fair skinned persons, as well as the light-coloured palms and soles of dark-skinned individuals (Passeron and Ortonne, 2010).

2.3 Prognosis of vitiligo

Because there are no good laboratory markers for prognosis at the moment, clinical measures can only be utilised to assess disease activity (Halder *et al.*, 1987). The prognostic variables in vitiligo

have been described by Hakim Akbar Arzânî. Curable lesions include those that do not damage the hairs and those that become red when rubbed (Arzani; Samarqandi, 2009). When no redness or bleeding occurs after pricking, white shiny patches of vitiligo develop on the skin. This is difficult to cure (Zohr Abu Marwan, 1986).

3. Materials and Methods

This research project was registered in Clinical Trial Registry India on 21/03/2016. With CTRI number-CTRI/2016/03/006754. The study was conducted at the Out Patient Department of National Research Institute of Unani Medicine for Skin Disorders, Hyderabad. At the study centre, the patients of vitiligo (baras) were screened and the trial was carried out. The screened cases data was recorded. The collected data was analysed statistically based on age of patient, gender, types of vitiligo, triggers, age on set, family history, marital status, socio economic status, chronicity, type of onset, *etc*.

3. Results

The demographic data of the total number of 864 patients showed the mean age to be 35 ± 12.38 years. The minimum and maximum age of patients were 14 and 67, respectively, which shows individuals turn up for the cure at any age. Figure 1 depicts distribution of patients according to gender as 431 (49.88%) subjects were males, whereas 433 (50.1%) were females.

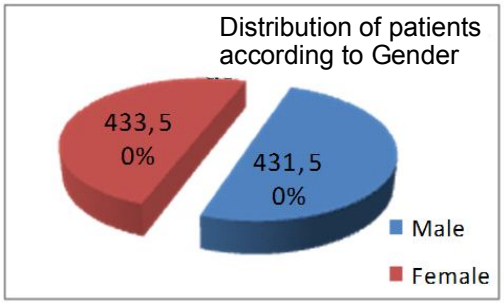

Figure 2: Distribution of patient's according to gender.

According to educational qualification, it was observed that maximum no. of patients, *i.e.*, 300 were professionals, 187 were graduates/post graduates, 135 possessed higher secondary/ intermediate education. Only 2 were illiterate (Figure 2).

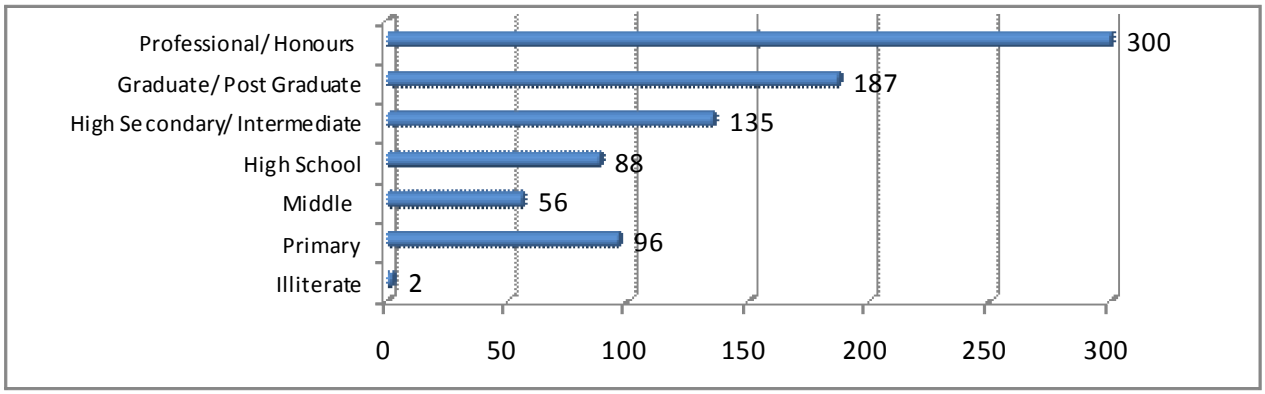

Figure 3: Distribution of patients according to educational qualification.

The familial incidence was observed in 162 (M=79, F=83) (18.79%) subjects, and 702 (81.25%) has no family history of vitiligo. From these screened subjects, 567 (65.62%) were married, 291 (33.68%) were unmarried and 6 (0.69%) were divorcee which shows vitiligo has no effect on marital status.

The highest incidence was observed in middle class, *i.e.*, 416 (48.14%), followed by 393 (45.48%) in lower class and 55 (6.36%) in higher class.

The mean age of onset of disease was 28 ± 14 years. The minimum and maximum age of onset of the disease were 1 and 65 years, respectively, indicating there is no such age of onset, *i.e.*, vitiligo can start at any age at but usually appears before the age of 30 years. From 864 screened participants, 134 (15.51%) were diagnosed with segmental vitiligo. 730 (84.49%) were grouped under non-segmental vitiligo, 565 (65.39%) were of focal type, 299 (34.60%) were of mucosal type as illustrated in Figure 4.

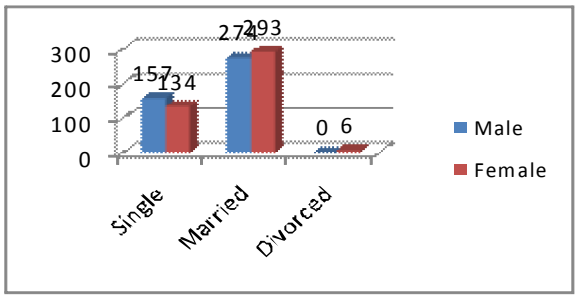

Figure 4: Distribution of patients according to marital status.

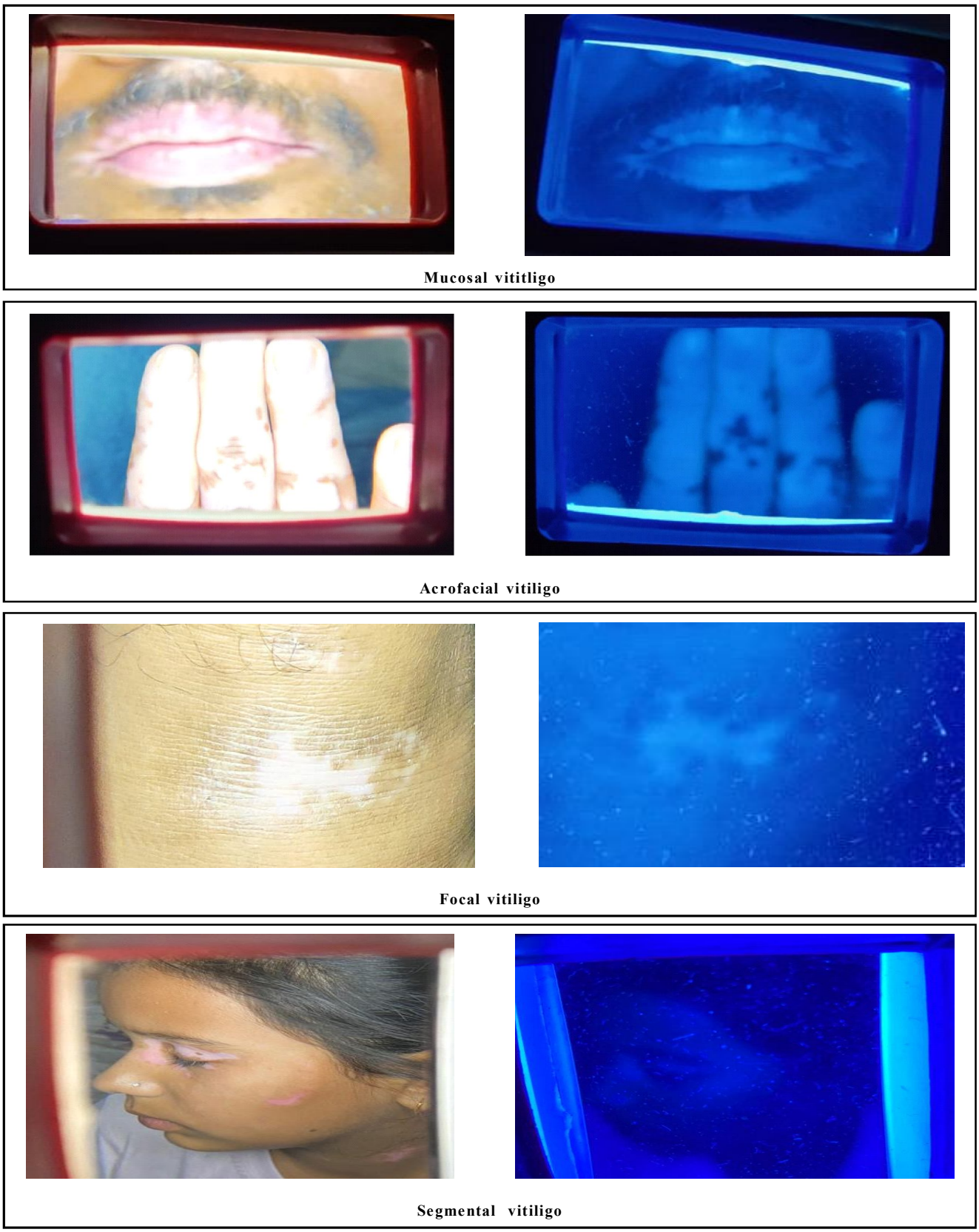

Figure 5: Illustration of various types vitiligo seen through the Wood's lamp under white and blue light.

The chronicity of the disease ranged from 1 year to 40 years with a mean of 8 ± 6 years. According to mode onset, the maximum number of subjects are unicentric, *i.e.*, 621 (71.90%). The total number of multicentric origin cases were 243 (28.12%). Among the cases screened, most of them had perifollicular pigmentation 724 (83.79%), 140 (16.20%). In most of the cases, 475 (54.97%) cases range from 0 to 20 lesions, followed by 178 (20.60%), 166 (19.21%), 44(5.09%) cases ranges from 21 to 40, >70, 41 to 70, respectively. The body surface area (BSA) affected with vitiligo ranged from 0.1% to 95% with a mean of 5.70 ± 4.8%. In most of the patients, *i.e.*, 287 (33.21%) the site where depigmentation first appeared was face, then in 265 (30.67%), 187 (21.64%), 82 (9.49%), and 43 (4.9%), the sites were lower limb, upper limb, trunk, and neck, respectively. It was observed that new lesions appeared in last 3 months were on the upperarm (21.64%), face (18.8%), lower limb (16.4%). 449 (51.96%) cases did not show progression or extension of lesions. 415 (48.03%) cases showed extension of lesions. Leucotrichia was present only in 118 (13.7%) cases. Koebner's phenomenon was present in 103 (11.92%) cases. According to temperament, most of the patients, *i.e.*, 42% was known to have Sanguine temperament (Damavi mizaj), followed by Phlegmatic (Balghami) (39.33%), Choleric (Safravi) (16%), and Melancholic (Saudavi) (2.6%). 715 cases had past treatment history and 149 had no treatment history. 339 cases took allopathic medication, 165 took Ayurvedic, 118 Unani, and 93 cases had Homeopathic medication.

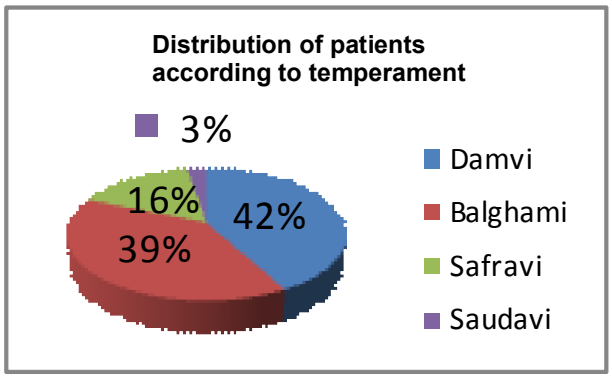

Figure 6: Distribution of patients according to temperament.

Table 2: Triggers of vitiligo

Triggers of vitiligo	No. of patients	Percentage
Stress	276	31.94%
Infection/Illness	87	10.07%
Drugs	78	9.03%
Irritant and chemicals	35	4.05%
Pregnancy	28	3.24%
Trauma	104	12.04%
Tobacco/Alcohol	13	1.50%
No trigger	243	28.13%

4. Discussion

The most significant fact to the patient affected by vitiligo is that, it causes no physical symptoms or damage, but rather the interpretation they have for it. Vitiligo is devastation to patients and to the family members. Physicians usually do not pay attention to the most important aspect of vitiligo focussing on therapeutic procedures and sometimes even discourage treatment approaches because the disease is purely cosmetic.

In our study, we observed that the age of onset of the disease ranged from diversely indicating that vitiligo can start at any age. Equal distribution of patients according to gender showed that the disease is not associated with gender which is also supported in the study by Patil *et al*. (2014). Family, history was found to be present in 20.9% cases which coincides with the study by Chekuru *et al*. (2022). Among them, only 11.9% of the cases reported to have Koebner's phenomenon and 13.7% had Leucotrichia. An increase in psychological and social stigma associated with this disease is leading to serious consequences on the life of a person or creates social embarrassment, anxiety and shame. It was also noticed that allopathic treatment history was found in more number of cases indicating that allopathy was the first drug of choice for most of the patients. This arises the need for awareness of Unani system of medicine which has a safe and effective treatment option.

5. Conclusion

Vitiligo is an important skin disorder having major impact on quality of life of patients. The chronic nature of the disease, long term treatment and unpredictable course of disease is usually demoralising to patients suffering with vitiligo. The professional population are usually more prone to vitiligo whose trigger could probably be stress. Thus, the counselling of the patients could be more helpful apart from the treatment regime. Although, vitiligo is not the life threatening disease, the impact on the life of patients is profound. The triggers associated with this disease could be dealt with awareness by avoiding the same.

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Conflict of interest

The authors declare no conflicts of interest relevant to this article.

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