Original Research Article

NB-UVB phototherapy combined with tacrolimus ointment in vitiligo treatment

ABSTRACT

Background: Vitiligo, often referred to as "Sheti" in our region, is a chronic disorder in which the skin loses its pigment or melanocyte-generating cells, causing it to become very pale or pink. Usually, in this disease, ointments, vitamin therapy, phototherapy, etc. are used.

Objective: Vitiligo is often treated with phototherapy that utilizes narrowband ultraviolet B (NB–UVB). This study aims to investigate the effectiveness of combination therapy of NB–UVB phototherapy and tacrolimus in vitiligo treatment

Methods: A retrospective questionnaire-based study was conducted for seven months (August 2019 to February 2020). About 95 patients with vitiligo in Dhaka were taken for observation. Microsoft Office Excel 2010 software was used to do the analysis.

Results: In this study, 34.37% of patients were male, and on the other side, about 65.63% of patients were female. And most of the patients were young aged (21-30). In this case, females are mostly conscious of their skin health. One hundred forty lesions were treated on the face, extremities, and trunk. Excellent results were achieved in 66.43% (93/140) lesions, while 20.71% (29/140) lesions exhibited a good response. The response was termed poor as the extent of pigmentation achieved was less than 12.86% (18/140).

Conclusion: In this study, we found that the combination of NB-UVB phototherapy and tacrolimus is potentially effective in vitiligo, with the face and extremities responding better than other body sites. It may be much more effective if combination therapy is used.

Keywords: Vitiligo, Narrowband ultraviolet B, Tacrolimus, Dhaka, Bangladesh,etc.

1. INTRODUCTION

Vitiligo has emerged as a significant socioeconomic issue in Bangladesh in recent years. Surprisingly, due to their lack of awareness about health, most people indicate that this ailment is a contagious sickness. Vitiligo, often referred to as "Sheti" in our region, is a chronic disorder in which the skin loses its pigment or melanocyte-generating cells, causing it to be pale or pink. Sheti is another name for vitiligo. It is usual for these white spots to occur on the hands, feet, arms, cheeks, and lips; however, the condition can affect any

portion of the skin. Additional common sites of infection include the vaginal region, the armpits, the groin, the area surrounding the mouth, the eyes, the nose, and the navel. Approximately 0.5–2% of the world's population is affected by this depigmenting condition [8].

Although there is still disagreement as to what the actual etiology of vitiligo is, doctors and other medical experts have narrowed down a few of the risk factors that they believe are to blame for the development of the disorder. Among these are an autoimmune disorder (in which the immune system of the body mistakenly targets and damages these particular cells within one's own body), heredity, burns or accidental injury, and at the same time, some studies have suggested that stress also plays a significant role in the development of this disorder [8].

Figure 1: Patient of vitiligo [13].

Concurrently, some compounds, such as mono benzyl ether of hydroquinone-containing goods and phenols (Rhododenol) containing cream, can potentially interfere with the skin's natural pigmentation. For example, this happened in Japan when a product marketed as a skin-lightening cream produced widespread vitiligo among the product's user base due to the usage of a phenol (rhododenol) as an active component in the product. Rhododenol was the active ingredient. Unfortunately, Vitiligo patients have a greater chance of getting certain disorders, including hypothyroidism (a condition in which the thyroid is underactive) and hyperthyroidism (a condition in which the thyroid is hyperactive), and type 1 diabetes. In addition, those who have certain illnesses have a higher probability of acquiring vitiligo. Vitiligo may be treated, however, if it is causing the patient to experience mental or social suffering. Vitiligo patients have various treatment options available, one of which is the attempt to restore normal skin color to vitiligo-affected regions. These include depigmentation and skin grafting, as well as topical therapies, steroid creams, ultraviolet B-light therapy, oral medications, and steroid creams [8].

2. MATERIAL AND METHODS

The current protocol is comprised of a short explanation of the research type, the length of the study, the study design, the inclusion and exclusion criteria, the operational mode of operation, and the fieldwork.

Study type: A retrospective questionnaire-based study.

Study duration: 7 months (August 2019 to February 2020)

Study design: Between the dates August 2019 and February 2020, a study was carried out in the city of Dhaka to determine the pattern of vitiligo as well as the treatment for it at the tertiary health care level. A study of 95 vitiligo patients who exhibited the signs and symptoms of the condition was carried out.

Inclusion and exclusion criteria: At the Aurora Skin and Hair Research Institute, all of the vitiligo patients came for treatment, and while they were there, the patients were observed for research purposes. Patients who did not exhibit a sufficient number of signs and symptoms of vitiligo during the trial were not considered for inclusion.

Operational modality: The Microsoft Office Excel 2010 software was used to analyze the data about age, sex, biophysical features, diagnosis, therapy, possible medicines that cause vitiligo, the kind of vitiligo, and drugs used to control vitiligo symptoms.

Data collection form: The information that was requested on the data collecting form included the patient's identity number, as well as their name, gender, marital status, age, personal history, age distribution, and other relevant information. In addition, the causes of vitiligo, signs, and symptoms of the disease, side effects of various medications, different treatment options, numerous home remedies, and other alternative treatments were included in the questionnaires.

Research Framework: All field interviewers were well-versed in the theory behind data collection methods and the practical use of those methods, and both were experts in the disease they were studying. Patients were educated on the study's goals, and those who were comfortable doing so signed an informed consent form.

Patients were randomly assigned to either an intervention or a control group, with recorded demographic information such as age, sex, and disease duration. Patient’s occupations, family histories, socioeconomic positions, dietary habits, and social problems were all documented in this socio-demographic study.

3. Treatment Protocol

As all patients were skin types 3 & 4. Minimal Erythema Dose (MED) was not calculated & an initial dose of 300 mj/cm2 was started in all adult patients & 150 mj/cm2 in children. Treatment was administered 2 times in a week on non-consecutive days.

The irradiation dose was increased by 20% for each subsequent visit till the optimal amount was achieved to obtain minimal erythema in the lesions. During treatment, affected parts were only exposed & genitalia & other uninvolved areas were protected. Eyes were protected by the UV-blocking goggles. The maximum treatment period was 6 months or earlier or if 75% or greater repigmentation was achieved.

4. RESULTS

4.1 Age & Sex Distribution

In this study, 34.37% of patients were male, and on the other side, about 65.63% of patients were female. And most of the patients were young aged (21-30). In this case, females are mostly conscious of their skin health.

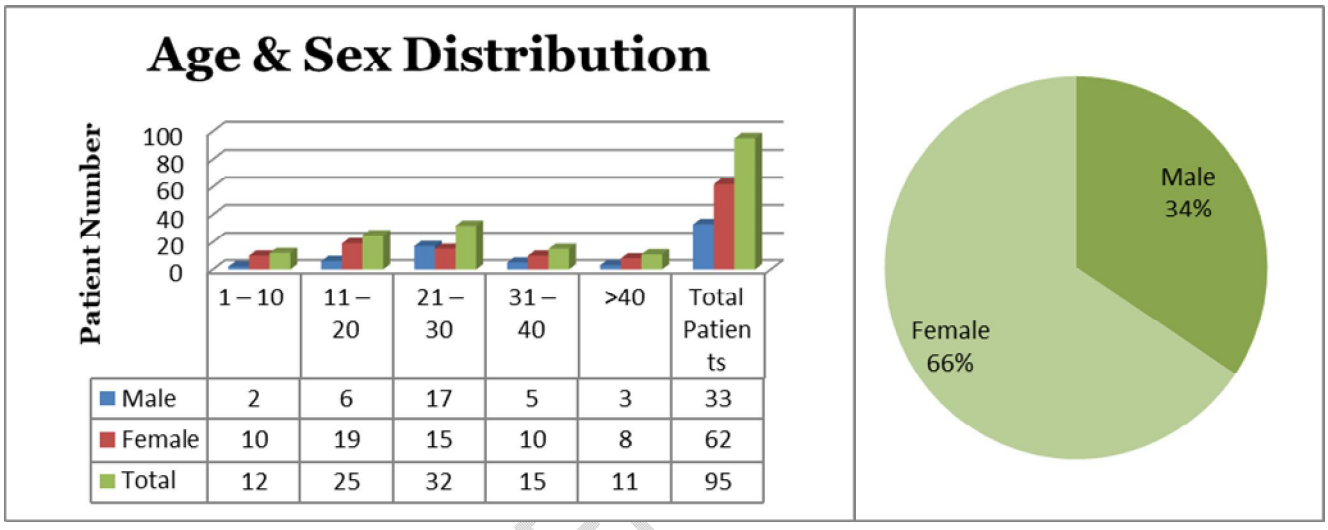

Fig 2. Distribution of the participant by age and sex.

4.2 Clinical types of vitiligo

Table 1. Clinical types of vitiligo among the patients

Type of Vitiligo	Inactive	Progressive	Stable	Total
Generalized	20	6	-	26
Acral	13	9	1	23
Focal	21	6	4	31
Segmental	7	3	5	15

4.3 Response of vitiligo

Table 2: Result of the combination therapy of NB-UVB phototherapy and tacrolimus in vitiligo treatment.

Response	Face	Trunk	Extremities	Total
Excellent	38	22	33	93
Good	12	6	11	29
Poor	7	6	5	18

140 lesions were treated on the face, extremities, and trunk. Excellent results were achieved in 66.43% (93/140) lesions, while 20.71% (29/140) lesions exhibited a good response. The response was termed as poor as the extent of pigmentation achieved was less than 12.86% (18/140).

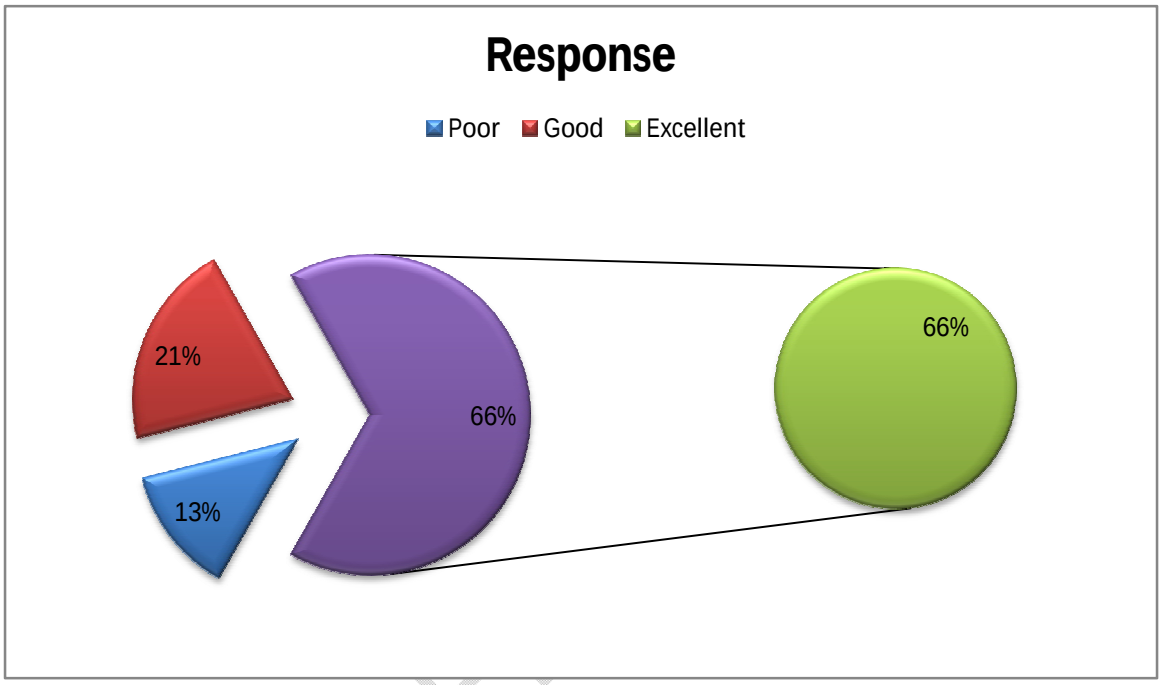

Fig 3. A total response of the combination therapy of NB-UVB phototherapy and tacrolimus in vitiligo treatment.

5. DISCUSSION

Vitiligo is the most frequent kind of depigmentation condition. It is characterized by a loss of pigmentation in the skin, hair, and mucosal surfaces [6]. Its frequency seems to be equal between men and women, and there is no variation in the incidence of occurrence according to either skin type or race [3]. The average age at which it first manifests itself is roughly 24 years old. It has been hypothesized that autoimmune melanocyte loss is caused by a mix of environmental [9], genetic, and immunological variables interacting with one another [2]. This is the theory supported by the strongest body of data [7].

Vitiligo is a skin condition that can be treated with various treatments [1]. Still, one that is gaining in popularity is targeted phototherapy with lasers, lamps, or ultraviolet sources. Many clinical investigations in vitiligo have established the effectiveness of targeted phototherapy [11], particularly NB-UVB phototherapy [10]. In addition, there are a few topical therapeutic options that, when combined with this treatment technique, have been demonstrated to have a synergistic impact [4]. Studies conducted in clinical settings have shown that the effectiveness of targeted phototherapy, which may include NB-UVB phototherapy [5], varies depending on the location of the vitiligo lesions being treated. Clinical research has shown that the face and legs respond the best to targeted phototherapy, while acral lesions respond the least favorably [12].

In this study, we found that the combination therapy of NB-UVB phototherapy and tacrolimus is potentially effective in vitiligo, with the face and extremities responding better than other body sites.

ETHICAL APPROVAL (WHERE EVER APPLICABLE)

The study design was approved by Aurora skin and Aesthetics.

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ABBREVIATIONS
NB-UVB = Narrow band Ultraviolet-B
MED = Minimal Erythema Dose