ORIGINAL ARTICLE

Efficacy of topical 5% Minoxodil Solution in the Treatment of Alopecia Areata

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ABSTRACT

Aim: To assess the efficacy of topical 5% minoxodil solution in the treatment of alopecia areata.
Study design: A randomized controlled trial
Place and duration of study: Outpatient Department of Dermatology, Sargodha Medical College/District Teaching hospital, Sargodha from March to September 2015.
Methodology: A total of 80 patients of alopecia areata were selected for this study. The patients were randomly divided into study and control groups, using random numbers table, having 40 patients each. All patients included in the study group were asked to apply 5% minoxodil solution, twice daily for a period of three months, whereas the patients of control group were asked to apply liquid paraffin twice daily for three months. All the patients were followed up monthly during the treatment period of three months. The treatment was considered efficacious, when 50% or more area of the patch of alopecia areata showed a re-growth of hair after three months of treatment.
Results:: A total of 80 patients there were 19 male (47.5%) & 21(52.5%) female with mean age of 26.4±7.1 years and in control group was 26.5± 8.5 years. After three months of treatment, in study group A statistically significant efficacy was found in 29(72.5%) patients, While in control group the efficacy was found in 3(7.5%) patients.
Conclusion: It is concluded from this study that topical 5% minoxidil solution is significantly effective, as compared to control group, for treating alopecia areata.
Keywords: Alopecia areata, minoxodil solution, liquid paraffin, efficacy

INTRODUCTION

Alopecia areata (AA) is a disease characterized by patchy loss of hair affecting the hair-bearing area particularly scalp.1,2 On ethnic and geographic basis there is huge variation in incidence and prevalence of AA but at any given point of time there is about 0.2% of people in the world which are affected from AA[1,2]. Affecting both the sexes equally, the peak incidence of AA is in early childhood and among early puberty to young adults of age around 15-29 years[3].

AA being a chronic autoimmune disease, affects the hair follicles and rarely nails in the genetically predisposed people, is mediated by the hosts T-cell auto-reactivation[4,5,6]. Such individuals have high frequency of being affected with other auto immune diseases like type-I diabetes mellitus, allergic disorder, atopy, autoimmune thyroiditis, pernicious anemia, rheumatoid arthritis, vitiligo, lupus erythematosus[7,8]. Many environmental factors like drugs, infections, trauma and emotional stress are believed to set off the disease[9]. A patient of AA can present with either confluent hair loss or with loss of patchy hair that may be single or multiple over the patient's scalp or body[2]. In alopecia Totalis (affecting about 5% of patients of AA) there is complete loss of scalp hair[10]. While Alopecia Universalis is a condition affecting about 1-2% of AA patients in which there is loss of all the hair of body which includes pubic and scalp as well[10]. The loss of hair of scalp in band-like pattern around the periphery of scalp only is termed as Ophiasis[11].

In patients suffering from limited patchy AA for not more than 1 year the option of leaving the disease untreated may seem logical as there is spontaneous remission in about 80% of cases[11]. Treatment options for AA are numerous which includes tacrolimus, topical and systemic steroids, topical dithranol, tretinoin, minoxidil, PUVA therapy, oral immunosuppressive drugs and contact immunotherapy[12]. Minoxidil was being used originally for treating hypertension but it had a side effect and that was extensive hair growth, and now it is being prescribed to treat alopecia by applying either 2% or 5% topically[12]. It directly acts on hair follicles and stimulates their growth[11]. So, while treating AA the use of minoxidil especially in its 5% strength is found to be very effective[11]. As it is being applied topically and its systemic absorption is minimum through skin, its side effects are very rare[11]. A double blind study was conducted by Fenton and Wilkinson[13] in 30

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patients with alopecia areata. They observed a significant response rate of 74% in patients using 1% minoxidil as compared to placebo group's response rate of 7% after three months of treatment. During treatment, none of the patients showed any signs or symptoms of either local or systemic harmful effects of the drug.

In another study conducted by Fiedler-Weiss[14] in 66 patients of alopecia areata, comparing application of 5% and 1% minoxodil solution for three months, 81% response rate was seen in patients applying 5% minoxodil solution versus 38% response rate with 1% minoxidil solution. Only two of the 66 patients developed mild local irritation and itching during treatment.

Although, AA is a medically benign condition but it can cause tremendous psychological and emotional stress in affected individuals and their families, so there is an utmost need for an innovative methods in managing AA[15].

This study was devised to assess the effectiveness of topical 5% minoxodil solution in patients of AA

METHODOLOGY

Patients of alopecia areata, clinically diagnosed presenting at the Outpatient Department of Dermatology SMC/DHQ were enrolled in the study, using purposive non-probability sampling technique. Patient's particulars like name, age, sex and address were noted in a specially designed proforma. All enrolled patients were randomly divided into study and control groups, using random numbers table, having 40 patients in each group. The patients included in study group were asked to apply Minoxidil 5% solution over affected area, two time a day for about three months duration, while the patients included in control group were advised to apply liquid paraffin over the affected area two time a day for three months. During this study period, the patients were counselled not to use anything else over the affected area apart from hypoallergenic, non-medicated shampoo. All the patients were followed up monthly during the treatment period of three months. The efficacy of the drug was assessed after three months of treatment by measuring the percentage area of patch of alopecia areata, which showed re-growth of hair. The approximate area of each patch of alopecia areata was calculated by measuring diameter of the lesion. The treatment was considered efficacious, when 50% or more area of the patch of alopecia areata showed a re-growth of hair and the treatment was considered non-efficacious, when re-growth of hair was seen in less than 50% area of the patch of alopecia areata or no re-growth of hair at all after three months of treatment.

The two groups were compared for efficacy by applying Chi-square test. A p-value of ≤0.05 was considered significant.

RESULTS

In the study group, there were 19 (47.5%) male and 21 (52.5%) female patients. In the control group, there were 20 (50%) male and 20 (50%) female patients (Table I). Mean age of patients in the study group was 26.4±7.1 years and in the control group was 26.5±8.5 years. In the study group, there were 10 (25%) patients of age upto 20 years, 20 (50%) patients of 21-30 years, 9 (22.5%) patients of 31-40 years and 1 (2.5%) patient of 41-50 years. In the control group, there were 12 (30%) patients of age upto 20 years, 18 (45%) patients of 21-30 years, 7 (17.5%) patients of 31-40 years and 3 (7.5%) patients of 41-50 years (Table II).

Table I: Distribution of patients according to sex

Gender	Study Group	Control Group
Male	19(47.5%)	20(50%)
Female	21(52.5%)	20(50%)

Table II: Distribution of patients according to age

Age (yrs)	Study Group	Control Group
Upto 20	10(25%)	12(30%)
21-30	20(50%)	18(45%)
31-40	9(22.5%)	7(17.5%)
41-50	1(2.5%)	3(7.5%)
Mean±SD	26.4±7.1	26.5±8.5

On follow up of first visit in the study and control groups, there was no improvement (i.e. ≥50% of area of patch of alopecia areata did not show re-growth of hair (Table III).

Table III: Re-growth of hair at first follow up visit

Re-growth of hair (>50%)	Study group	Control group
Yes	0	0
No	40(100%)	40(100%)

On second follow up visit, 8(20%) patients in study group showed improvement (i.e. ≥50% of area of patch of alopecia areata showed re-growth of hair), while in the control group there was no improvement (Table IV).

Table IV: Re-growth of hair at second follow up visit

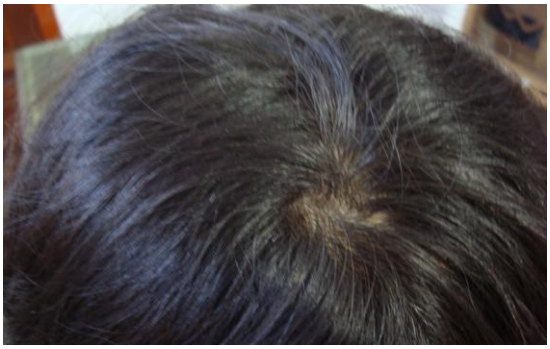
Re-growth of hair (>50%)	Study group (n=40)	Control group (n=40)
Yes	8(20%)	0
No	32(80%)	40(100%)

On third follow up visit, in the study group, there were 29 (72.5%) patients who showed improvement and 11 (27.5%) patients showed no improvement, while in the control group there were 3 (7.5%) patients with improvement, 35 (87.5%) patients with no improvement and 2 (5%) patients were lost to follow up (Table V).

Table VRe-growth of hair at third follow up visit

Re-growth of hair (>50%)	Study group (n=40)	Control group (n=40)
Yes	29(72.5)	3(7.5%)
No	11(27.5%)	35(87/5%)
Lost to follow up	0	2(5%)
Total	40(100%)	40(100%)

Fig. I-A: Alopecia areata (before treatment)



After three months of treatment, in the study group, the treatment was found to be efficacious in 29 (72.5%) patients, while in the control group, treatment was found to be efficacious in 3 (7.5%) patients, non efficacious in 35 (87.5%) patients and 2 (5%) patients were lost to follow up (Table VI).

Table VI: Distribution of patients according to efficacy of treatment at completion of the study

Regrowth of hair(>50%	Study group	Control group
Yes	29(72.5)	3(7.5%)
No	11(27.5%)	35(87/5%)
Lost to follow up	0	2(5%)
Total	40(100%)	40(100%)

Fig. I-B: After treatment with topical 5% minoxidil solution

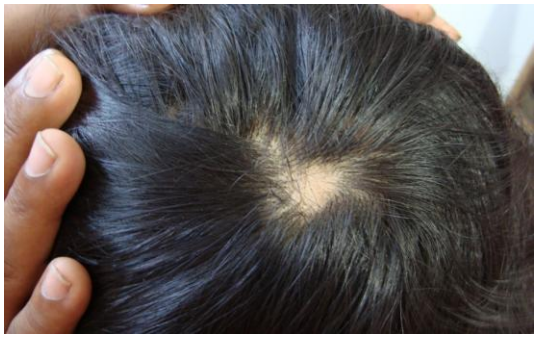


Fig. III-A: Alopecia areata (before treatment)

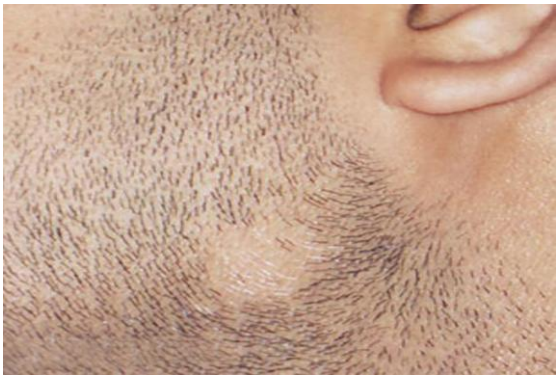
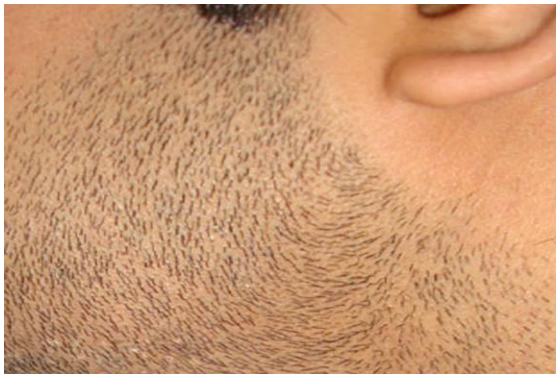


Fig. III-B: After treatment with topical 5% minoxidil solution



DISCUSSION

Alopecia areata is disease characterized by recurrent, non-scarring, patchy or confluent loss of hair affecting both sexes equally in all racial groups of about 0.2% of the world's population[1,2]. As there is no permanent cure for this type of hair loss therefore the key challenge in managing alopecia areata is to find a treatment method that really works. The present study was a step to improve the management of alopecia areata by assessing the efficacy of topical 5% minoxidil solution

Minoxidil was originally approved to treat hypertension[12]. Hair growth was seen initially as a side effect of the medication, afterwards, it began to be used as a topical solution for the treatment of male-pattern baldness[12]. Minoxidil is now being prescribed in two forms, for two different diseases. Hair loss and baldness is being treated by using topical Minoxidil solution while hypertension is being treated by oral minoxidil. The use of this drug is still experimental in alopecia areata.

We enrolled 80 patients. They were divided into two groups, study group and control group, using random numbers table, having 40 patients each. All the patients in study group were asked to apply 5%

topical Minoxidil solution over affected area two times a day for three months duration, whereas the patients of control group were asked to apply liquid paraffin twice daily for three months.

In our study, mean age of patients in the study group was 26.4±7.1 years and in the control group was 26.5±8.5 years. In the study group there were 47.5% male patients and 52.5% female patients, while in the control group, there were 50% male and 50% female patients. After three months of treatment, in our study group the efficacy was found in 72.5% patients, while in the control group the efficacy was found in 7.5% patients.

As Minoxidil induces hair follicle into transition phase from the early to late anagen therefore it is very effective in inducing hair growth in patients suffering from alopecia.

CONCLUSION

It is concluded from this study that topical 5% minoxidil solution is significantly effective in the treatment of alopecia areata as compared to placebo.

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