DOI: https://doi.org/10.53350/pjmhs20221612801

ORIGINAL ARTICLE

A Study on the Role of Tofacitinib Among Patients Treated with Alopecia Areata

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ABSTRACT

Aim: To determine the efficacy of Tofacitinib in patients with Alopecia Areata.

Methods: This interventional study was conducted at Department of Dermatology, Fauji Foundation Hospital Rawalpindi and Cantonment General Hospital Rawalpindi from May, 2022 to October 2022 on 60 patients having hair loss on scalp >50%. Patients were administered with Tofacitinib 5mg BD for 24 weeks. Improvement was assessed by change in the Severity of Alopecia Tool (SALT) score from the baseline.

Results: This study was conducted on 60 patients having Alopecia areata. The age of the patients was 33.70±8.69 years. Patients with Alopecia areata 82.9% had >50% change in SALT score, while patients having Alopeciatotalis, 75% showed >50% change in SALT score and patients having Alopeciauniversalis 66.7% showed >50% change in SALT score.

Conclusion: From was study we conclude that tofacitinib is an effective treatment for patients with Alopecia areata.

Keywords: Alopecia Areata, Tofacitinib, Efficacy

INTRODUCTION

Hair follicles, nails, and even the retinal pigment epithelium can be affected by a condition called alopecia areata (AA). It's a non-scarring form of hair loss that shows up as spherical patches [1]. It appears that a hereditary component underlies the development of alopecia areata. Approximately 55% of identical twins are in agreement on at least one trait. Based on a recent meta-analysis of GWAS, researchers have pinpointed the HLA signal of AA primarily to HLA-DRB1. The usual killer cell receptor D (NKG2D), which contains genes for this and other autoimmune illnesses, has been linked to autoimmune encephalitis (AA) but no other autoimmune diseases [2].

Overall, about 2% of the population will have AA during their lifetimes [2]. The occurrence of alopecia areata appears to rise approximately linearly with age, with the average onset occurring between the ages of 25 and 36 [3].Children under the age of 10 typically exhibit more severe symptoms of the early-onset AA subtype. Inconclusive evidence points to a preference for either sex [4]. It's linked to an elevated risk of various autoimmune disorders, particularly lupus erythematosus, vitiligo, and autoimmune thyroid disease [5].

Alopecia totalis (AT) and alopecia universalis (AU) are resistant in traditional therapies with topical and systemic immunosuppressant, and relapses are prevalent. Alopecia areata is being treated with tofacitinib citrate, which the FDA first approved in 2012 for the treatment of moderate to severe arthritis (AA) [6, 7].Tofacitinib prevents phosphorylation and triggers STAT, as has been documented in prior research. A monitoring of cells involved in hematopoiesis and immune cell function recorded the JAK-STAT expression pattern [8]. Infections of the respiratory tract, headaches, and diarrhea are also possible adverse effects [9, 10]. There is a potential for disease transmission at higher dosages (10 mg

), more severe infections, resurgence of herpes zoster infection, and serious infections when used in conjunction with methotrexate or corticosteroids [11, 12].

Alopecia areata impacts individuals of all ages, and the emotional toll of losing hair can prompt them to seek out mental health treatment in the wake of unsuccessful attempts at treating their thinning hair. However, very few studies are conducted in reflecting the usefulness of Tofacitinib among patients treated with alopecia areata. That is why, I aimed to carried out a study on the role of tofacitinib among patients treated with alopecia areata.

MATERIAL AND METHODS

We conducted this interventional study on 60 patients at Department of Dermatology, Fauji Foundation Hospital Rawalpindi and Cantonment General Hospital Rawalpindi from May, 2022 to October 2022 after taking ethical clearance certificate from the hospitals. Patients were recruited in the study from Department of Dermatology OPD. Patients were brief about the entire procedure of the study and the benefits of the study were explained. All the patients gave consent for participating in the study. We included patients having Alopecia areata with >50% of hair loss on scalp, having Alopeciatotalis and Alopeciauniversalis confirmed by a consultant dermatologist having more than 5 years of experience. We excluded patients who were already taking treatment for hair growth, patients having HBV/HCV, patients with renal diseases and pregnant women.

Patients were given 5 mg of Tofacitinib BD for 24 weeks. The patients were evaluated for hair loss using Severity of Alopecia Tool (SALT). A SALT score of 0 indicates no hair loss while 100% indicated complete hair loss. The improvement in patients was assessed by observing the change in SALT score from the baseline SALT score. A change of <5% indicated no response to the treatment, a score of 5 to 50% was considered partial improvement and a score of higher than 50% was considered as effective.

Data was analyzed using IBM SPSS 20. Frequencies and percentages were calculated for qualitative variables while for quantitative variables Mean and Standard deviation were calculated. Tables and charts were used for presentation of qualitative and quantitative variables.

RESULTS

This study was conducted on 60 patients having Alopecia areata. Patients' mean age was 33.70±8.69 years. The mean duration of disease was 4.93±3.42 years and the mean age of onset was 28.76±7.36 years. We observed that 75% were male patients. The most common variant of AA was Alopecia areata 58.3%, Alopeciatotalis was 26.7% and Alopecia universilas was 15%.

Regarding the improvement in AA patients we observed that patients with Alopecia areata showed highest percent change in SALT score 82.9% patients had >50% change in SALT score, while patients having Alopeciatotalis 75% showed >50% change in SALT score and patients having Alopeciauniversalis 66.7% showed >50% change in SALT score.

Graph 1 exhibits the distribution of age. Most of the patients were from the age cluster of 18 to 35 years while there were

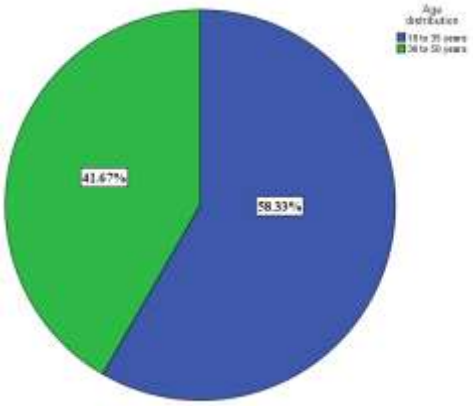
41.67% patents in the age cluster of 36 to 50 years. Graph 2 exhibits the adverse events occurred during the study, we observed that 70% patients did not have any adverse effect from the drugs while 30 patients had developed adverse effects. Out of those 30% patients majority had reported diarrhea and second leading adverse effect reported was headache.

Table 1: Baseline characteristics of patients

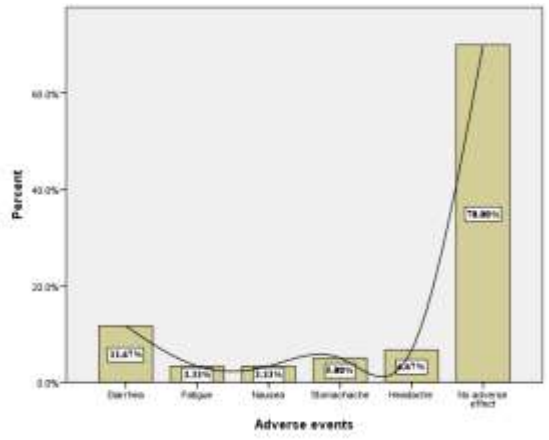
Baseline characteristics		
MEAN±SD		
Age (Years)	33.70±8.69	
Duration of disease (Years)	4.93±3.42	
Age of onset (Years)	28.76±7.36	
Frequencies and Percentages		
Gender	Frequency	Percent
Male	45	75.0
Female	15	25.0
Type of AA	Frequency	Percent
Alopecia areata	35	58.3
Alopeciatotalis	16	26.7
Alopecia universilas	9	15.0

Table 2: Improvement in AA patients according to change in SALT score

		SALT score change			Total
		< 5%	5 to 50 %	> 50%	
Type of Alopecia areata	Alopecia areata	2	4	29	35
		5.7%	11.4%	82.9%	100.0%
	Alopeciatotalis	2	2	12	16
		12.5%	12.5%	75.0%	100.0%
	Alopeciauniversalis	1	2	6	9
		11.1%	22.2%	66.7%	100.0%
Total		5	8	47	60
		8.3%	13.3%	78.3%	100.0%



Graph 1: Age distribution



Graph 2: Adverse events

DISCUSSION

Alopecia areata is a type of autoimmune disorder that causes loss of hair on the scalp and other parts of the body. The condition affects both men and women, and can occur at any age. There are several subtypes of alopecia areata, including patchy alopecia areata, alopecia totalis, and alopecia universalis.[13]

Traditionally, management options for alopecia areata have been limited to topical and intralesional corticosteroids, topical minoxidil, and anthralin. However, these treatments are not always effective, and some patients may not respond to them at all. Therefore, researchers have been exploring new treatment options for alopecia areata, including the use of tofacitinib.[14]

Tofacitinib is a medication that is approved for the treatment of rheumatoid arthritis. It works by blocking the action of certain proteins called Janus kinases (JAKs), which play a role in the immune system. In studies, tofacitinib has been found to be effective in promoting hair growth in patients with alopecia areata. Janus kinase inhibitors have been shown to attenuate the inflammatory cascade associated with AA.[15]

We conducted this study on 60 patients having >50% scalp involvement in patchy alopecia areata, alopecia totalis, or alopecia universalis. Patients mean age was 33.70±8.69 years which is comparable to a study[16] conducted in Bangladesh, they reported mean age of the patients 33.00 ± 13.1 years. The mean age of onset was 28.76±7.36 years, our findings are similar to the aforementioned study[16] which reported the mean age of onset 35.1±7.8 years. We observed that gender wise majority of the patients were male as compared to female patients (75% vs 25%), this is also comparable to the previous study[16] which reported gender predominance.

In our study 58.3% patients were presented with Alopecia areata, Alopeciatotalis was observed in 26.7% patients and Alopecia universalis was observed in 15% patients. Alopecia areata was the most common type observed, our findings are comparable with various studies which reported that majority of their patients had Alopecia areata variant.[16, 17] Alopeciatotalis was the second most common variant in our study[16] which comparable to the aforementioned study conducted in Bangladesh.

We observed that patients having AA variant 5.7% had no response to the treatment while 11.4% patients had 5 to 50% change in the SALT and greater than 50% change in SALT score was observed in 82.2% patients. In patients with Alopeciatotalis 12.5% had no response while 12.5% had 5 to 50% change in SALT score and greater than 50% change was observed in 75% patients. In patients with Alopeciauniversalis patients 11.1% showed no response, twenty two percent had 5 to 50% change in SALT score and 66.7% had > 50% change in the SALT score. Our results are comparable with a study[16] which reported the similar findings, in their setup 84.6% patients of AA variant showed >50% change in SALT score, patients having Alopeciatotalis variant showed 72.7% change in SALT score and in Alopecia universalis variant, patients showed 62.5% response. Our results confirmed that administrating 5mg Tofacitinib BD for six months can result in positive improvement in AA patients, our findings are in agreement with various studies conducted in various countries.[18, 19, 20]

CONCLUSION

From our study we conclude that administrating Tofacitinib to AA patients can improve hair growth effectively. Our study was conducted in multi center, further studies need to be conducted for exploring more clinical factors of Tofacitinib.

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