Comparative Study Between Platelet Rich Plasma and Minoxidil in The Treatment of Alopecia Totalis

Thesis

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Dina Hesham Adel Nour El din

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List of Abbreviations

Abb.	Full term

AA .....Alopecia areata.

PRP.....Platelet rich plasma.

CD.....Cluster of differentiation.

NK.....Natural killer.

HLA .....Human leucocytic antigen.

MHC .....Major histocomptability complex.

JAK.....Janus Kinase.

SALT .....Severity of alopecia tool score.

PPP .....Platelet poor plasma.

P-PRP .....Platelet pure rich plasma.

L-PRP .....Leucocyte rich platelet rich plasma.

FDA.....Food and drug administration approved.

HE.....Hematoxylin and eosin.

Abstract

Our results showed no significant clinical improvement with PRP treatment,however dermoscopic features showed significantly improvement after PRP compared to minoxidil so we suggest that PRP treatment in alopecia totalis could be of benefit as adjuvant therapy in addition to the main treatment of alopecia totalis.

We highly recommend using dermoscope as an advanced aid in clinical dermatological diagnosis and a great follow up tool.

Further studies are still recommended on a large number of patients in a trial to identify more uses of dermoscope and more medications to treat alopecia totalis.

Keywords: - *Major histocomptability complex- Cluster of differentiation- Platelet rich plasma- Alopecia areata- Leucocyte rich platelet rich plasma- Hematoxylin and eosin*

INTRODUCTION

Alopecia areata (AA) is a relatively common inflammatory disorder causing patches of non scarring hair loss ***(Madani and Shapiro, 2000).***

Although the pathogenesis is not fully understood, considerable evidence suggests that autoimmune attack of the hair follicles causes alopecia areata ***(Alexis et al., 2004).***

Most patients with AA have a mild disease consisting of several alopecia patches that regrow hair within a year. However, a subset of up to 10% of patients with AA have a prolonged disease course progressing to complete loss of scalp hair (alopecia totalis) or scalp and body hair (alopecia universalis) ***(Gilhar and Kalish, 2006).***

This extreme hair loss results in cosmetic disfigurement that may contribute to psychosocial abnormalities such as anxiety, depression, lack of self-confidence, and poor overall mental health ***(Güleç et al., 2004).***

The management of AA involves both addressing the psychological needs of the patient and offering treatment to patients who desire intervention. A variety of topical, intralesional, and systemic agents, as well as devices, have been used for alopecia, but the response to treatment varies widely, and few well-designed clinical trials have evaluated these therapies.

The choice of therapy depends primarily on the patient's age and the extent of the hair loss ***(Delamere et al., 2008).***

A non-specific treatment modality for AA is minoxidil, which prolongs anagen phase and promotes growth of longer and wider hair. These treatments stimulate hair growth but do not prevent hair loss and probably do not influence the course of the disease ***(Shapiro and Price, 1998)***.

Recently, autologous platelet-rich plasma (PRP) has attracted attention in various medical fields, including plastic and orthopedic surgery and dermatology, for its ability to promote wound healing. PRP has been tested during facelift and hair transplantation to reduce swelling and pain and to increase hair density ***(Li et al., 2012).***

Platelet Rich Plasma is defined as a sample of autologous blood with concentrations of platelets above baseline values.Platelets play an instrumental role in the normal healing response via the local secretion of growth factors and recruitment of reparative cells ***(Eppley et al., 2004***).

A significant improvement in hair density and stimulation of growth was observed when follicular units were pretreated with platelet plasma growth factors before their implantation. It was hypothesized that growth factors released from platelets may act on stem cells in the bulge area of the

follicles, stimulating the development of new follicles and promoting neovascularization ***(Cervelli et al., 2009).***

There are scarce reports in the literature about the effect of PRP on hair growth.

Aim of the Work

The aim of the current thesis was to assess the role of PRP in the treatment of alopecia totalis as compared to intradermal minoxidil 2%.

Chapter 1
ALOPECIA AREATA

Alopecia areata(AA) is a complex genetic, immune mediated disease that affects anagen hair follicles. The disease affects children and adults, males and females, and people of all ages and races. AA can be a chronic relapsing disorder that results in non-scarring hair loss of which there are three major clinical presentations ***(Hordinsky, 2013).***

Localized AA is characterized by round or oval patches of non-scarring hair loss in any hair bearing area. A subset of 10% of AA patients may advance to loss of all scalp hair (alopecia totalis) or all body hair (alopecia universalis) or ophiasis hair loss, but many patients may present anywhere along the spectrum from patchy to total body hair loss ***(Messenger et al., 2012).***

Not all patients may require treatment, as up to 50 % of patients with limited disease of less than 1 year duration can experience spontaneous hair re-growth ***(Hordinsky, 2011).***

Commonly associated diseases include asthma, allergic rhinitis, atopic dermatitis, thyroid disease, and autoimmune diseases, such as thyroiditis and vitiligo ***(Messenger et al., 2012).***

Alopecia areata has a variety of clinical courses, and it is not easy for clinicians to predict prognosis and clinical outcome of each patient. However, several epidemiologic studies on