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Short Communication

Chemotherapy-Induced Alopecia: A Brief Review

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ABSTRACT

Chemotherapy-Induced Alopecia (CIA) occurs in a large proportion of patients undergoing chemotherapy. This happens because hair bulb cells have a high proliferation, being very susceptible to the drugs used to fight cancer. It is important to carefully evaluate the treatment employed to anticipate persistent Chemotherapy-Induced Alopecia (pCIA). Trichoscopy has also been shown to be useful due to its practicality in monitoring the evolution of CIA.

Keywords: Alopecia; Post-chemotherapy alopecia; Chemotherapy-induced persistent alopecia

DESCRIPTION

Chemotherapy causes interruption of the mitotic activity of anagen follicle matrix cells, which corresponds to up to 90% of scalp hairs [1,2]. Consequently, hair loss occurs 1 to 3 weeks after its onset, characterizing anagen effluvium [1,3]. Hair loss varies according to the medication used and its dosage [3]. Normally, CIA is reversible, but in some cases hair loss can persist beyond six months after chemotherapy is stopped, with absence or suboptimal hair growth, which defines persistent CIA [4]. Thus, the dermatologist must be aware of the psychological impact generated on the patient and of current treatments to reduce the data caused by these types of alopecia. The main goals of CIA treatment are to stop or reduce hair loss and stimulate hair growth. Trichoscopy is an effective method that makes it possible to monitor the evolution of the CIA. After chemotherapy, trichoscopy shows findings compatible with damage to the follicular unit.

Until now, the most effective pharmacological therapies are: scalp cooling, the most used and studied [5], topical minoxidil, topical calcitriol and Lowlevel Laser Light Therapy (LLLT) [6,7]. Scalp cooling is considered the only effective agent in preventing CIA by the US Food and Drug Administration. Current meta-analyses demonstrate a 41% reduction in the risk of alopecia in patients with solid tumors [4,8]. The device consists of a scalp cooling system that promotes local vasoconstriction and reduces the influx of chemotherapy drugs into the hair follicles [5,9].Topical Minoxidil 2% and 5% is widely used and acts on the vasodilation of the arteries of the scalp and on the extension of the anagen phase of the follicle, which is more susceptible to the chemotherapeutic effect. Therefore, the use of Minoxidil is indicated only after chemotherapy has been discontinued, in order to obtain a better response [2]. Regarding calcitriol (1,25-dihydroxyvitamin D3), studies show that its topical use twice a day in patients with taxane-based chemotherapy is safe and well tolerated, with no effects on serum calcitriol levels [6]. Lowlevel laser light therapy (LLLT) for home use was effective in increasing capillary density in men and women with androgenetic alopecia, but there are not enough studies in patients with post-chemotherapy alopecia [7]. Other drugs studied in large studies, with promising results, are 5α-reductase inhibitors, spironolactone and bimatoprost. In animal models, epinephrine, cyclosporine, interleukin-1, inhibitors of Cyclin-Dependent Kinase 2 (CDK2), monoclonal antibodies (MAD11), N-acetylcysteine and iron chelator (M30) have been investigated to prevent CIA [10]. Among the non-drug mechanisms, microneedling and Platelet-Rich Plasma (PRP) are the most investigated for bringing benefits in other types of alopecia [11].

CONCLUSION

Chemotherapy-Induced Alopecia (CIA) occurs as a result of the excessive multiplication of hair bulb cells and their great susceptibility to cancer-fighting medications. Careful evaluation before chemotherapy treatment should be performed, and trichoscopy may be useful. In most cases, hair loss brought on by

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chemotherapy can be reversed, so the specialised physician needs to be aware of methods for preventing and treating it. Scalp cooling, topical minoxidil, and calcitriol are the most extensively researched treatment approaches with promising outcomes. Unfortunately, nothing has been able to stop it thus far.

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