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EFFICACY AND SAFETY OF OMEGA 3 FATTY ACID IN THE TREATMENT OF TELOGEN EFFLUVIUM IN MIDDLE AGED WOMEN

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Background: Omega-3 fatty acids (omega-3 FA) are constituents of the membranes of all cells in the body and are precursors of locally produced hormones, eicosanoids, which are important in the prevention and treatment of various diseases, especially in women. Telogen effluvium (TE) is one of the most common causes of diffuse non scarring hair loss. In its acute form, it generates a lot of anxiety in the patient, which can be significantly allayed with a confident diagnosis. **Objectives:** The aim of this study is to assess the Efficacy and safety level of omega 3 fatty acid in the treatment of telogen effluvium in middle aged women. **Methods:** This is an observational study. This study was carried out on 120 female patients attended in the Department of Dermatology, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh. The duration of the study period from January 2021 to December 2021. The period from Data was entered in MS Excel and Statistical analysis was done using SPSS-24. **Results:** A total of 120 patients, were evaluated prospectively. The baseline characteristics of women (Control) age, BMI, Telogen hair were 45.3±14.3, 19.8±2.5, 21.1±3.4. And (with supplement age, BMI, telogen hair were 47.6±10.2, 20.9±2.3, 20±4.1) **Conclusion:** Telogen effluvium, which commonly impacts women, begins suddenly with or without a recognizable initiating factor. It may be distinguished from traditional acute telogen effluvium by using its long fluctuating course.

INTRODUCTION

Shining and healthy hair is the attribution of good care of body and hair decoration gives women

Sense of wellbeing. Hair health and hair loss are major concern in men and women of all ages [(1)]. Most of the patient's loss self-esteem, negative effects on social life and increase feelings of depression with hair loss [(2)]. Common causes of hair loss disorders are androgenetic alopecia. Telogen effluvium, alopecia areata, and scarring alopecia [(3)]. Female pattern hair loss is diffuse reduction in hair density which affects the crown and frontal scalp, seen after puberty and affecting upto 50% of women over 50 years [(1)].

Telogen effluvium (TE) is one of the most common causes of diffuse non-scarring hair loss. Differentiating TE from other causes of diffuse non-scarring hair loss can indeed be a daunting task and TE is often used as a waste basket diagnosis [(4)]. The role of stress as a causative factor as well as the result of hair loss needs to be adequately understood. In physiological condition on scalp 80% hair in the course of growing (anagen), 1% in the period of involution of hair follicle (catagen) and the rest in the telogen period. Daily loss of hair normally 70-100 hair, but it becomes a problem when the loss is higher than 100/ day for longer than few weeks.

Telogen effluvium is a scalp disorder characterized by diffuse, non-scarring shedding of hair [(5)].

Telogen effluvium is a delayed consequence of a shift in the hair cycle phase away from anagen. Termination of anagen leads to onset of catagen and finally telogen. Five functional alterations in the hair cycle lead of increased telogen hair shedding. These are immediate anagen release, delayed anagen release, short anagen syndrome, immediate telogen release and delayed telogen release.

Telogen hair bulbs may remain anchored in the hair follicle until the onset of the next anagen phase at the end of telogen or be shed prematurely. Excessive loss of telogen hairs manifest as increased hair shedding [(6)].

The growth of the telogen hair ceases for 1 to 6 month (on average 3 months). When hair again enters the anagen it extruded from the follicle and hair shedding occurs [(7)]. Telogen effluvium is triggered by high fever, surgical trauma, sudden starvation, haemorrhage on initiation of a new drug, such as heparin, retinoid, propranol, captropril, allopurinol, Boric acid, phenytoin, glibenclamide, amphetamine, levodopa, Bromocriptine, Methysergide, Albenbzole, cimetidine. A validated visual analogue scale has been developed to measure hair shedding in women. Grade 1-4 are considered normal whereas grade 5 & 6 indicate excessive shedding [(6)]. In chronic form of telogen effluvium hair shedding persists longer than 6 months and it may be caused by thyroid diseases (hypothyroidism or hyerthyroidism), Profound iron deficiency anaemia, acrodermatitis enteropathica and malntrition. Telogen hair loss may be due to malignancy, Systemic lupus erythematosus. dermatomyositis and secondary syphilis.

Nutraceutical supplement is a mixture of Phyto compounds (Ganoderma lucidum, linum usitatissimum, cynara scolymust and galeopsis segetum ncek) with dihydrotestosterone inhibiting and antioxidant properties. It also contains polyunsaturated fatty acids, Rutin, Zinc, Biotin and ornithine. Deficieneics of minerals, essential fatty acids, amino acids and vitamins are major factors in hair loss [(3)].

Fats take part in steroid synthesis and have influence on keeping hair in skin integument. Fatty acid causes increased sebum production. Deficiency of these components causes hair dehydration and as a result improper state of hair bulbs and finally hair fall.

A formulation carrying 3-6 omega fatty acid, antioxidant phytosterols and vitamins can approach the multifactorial nature of this

problem. Phytosterols specially B-sitosterol have the capacity to inhibit 5α reductase type I and II responsible for conversion of testosterone into dihydrotestosterone has major role in hair miniaturization. Omega-3 and omega-6 exert antioxidant activity and reduce inflammation by directly influencing the arachidonic cascade [(1)].

Nutritional supplementation may be beneficial in TE like phenomena when there are no associated hormones. In protein deficiency reduced hair diameter and atrophic anagen bulbs seen on microscopy. There may be also color changes, loss of hair elasticity and hair texture becomes dry. Omega-3 fatty acid such as α linolenic acid, stearidonic acid, eicosapentaenoic acid, docosapentaenoic acid and docoscahexaenoic acid are key components of cell membranes and lamellar bodies of stratum corneum. Their deficiency causes depigmentation and loss of hair on scalp and eye brow.

Low consumption of linoleic and linolenic acids and long chain polyunsaturated fatty acids which are important ingredients of horny layer of epidermis causes hair loss. Omega-6 fatty acid mainly plant origin are also necessary for keeping proper build of hair however their excess in the diet may lead to immunological balance disorders of the body and higher risk of inflammation states. Which could cause hair asthenia and this loss [(8)] Fats should constitute 25-35% of diet and their source should be fish poultry, eggs, olive oil and rapeseed oil.

METHODS

The study was an observational study which was conducted in over a period from January 2021 to December 2021 with questionnaires at the Dermatology, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh were the study's settings. About 120 study population attended in the Department of Dermatology in this hospital. After collection, the data were checked and cleaned, followed by editing, compiling, coding and categorizing according to the objectives and variable to detect errors and to maintain consistency, relevancy and quality control. The choice of treatment was made by the patient after a full discussion with the multidisciplinary team consisting of Dermatologists. The data for this study about had been accumulated from patients' medical information. Statistical evaluation of the results used to be got via the use of a window-based computer software program devised with Statistical Packages for Social Sciences (SPSS-24).

RESULTS

Table 1 Baseline characteristics of women included in the study

	Supplement	Control
N	60	60
Age (years, mean±SD)	47.6±10.2	45.3±14.3
BMI (kg/m^2, mean±SD)	20.9±2.3	19.8±2.5
Telogen hair (%, mean±SD)	20. ±4.1	21.1±3.4

Table 1 shows that Baseline characteristics of women where, Supplement of Age, BMI, Telogen hair were 47.6±10.2, 20.9±2.3, 20. ±4.1. And Control of Age, BMI, Telogen hair were 45.3±14.3, 19.8±2.5, 21.1±3.4.

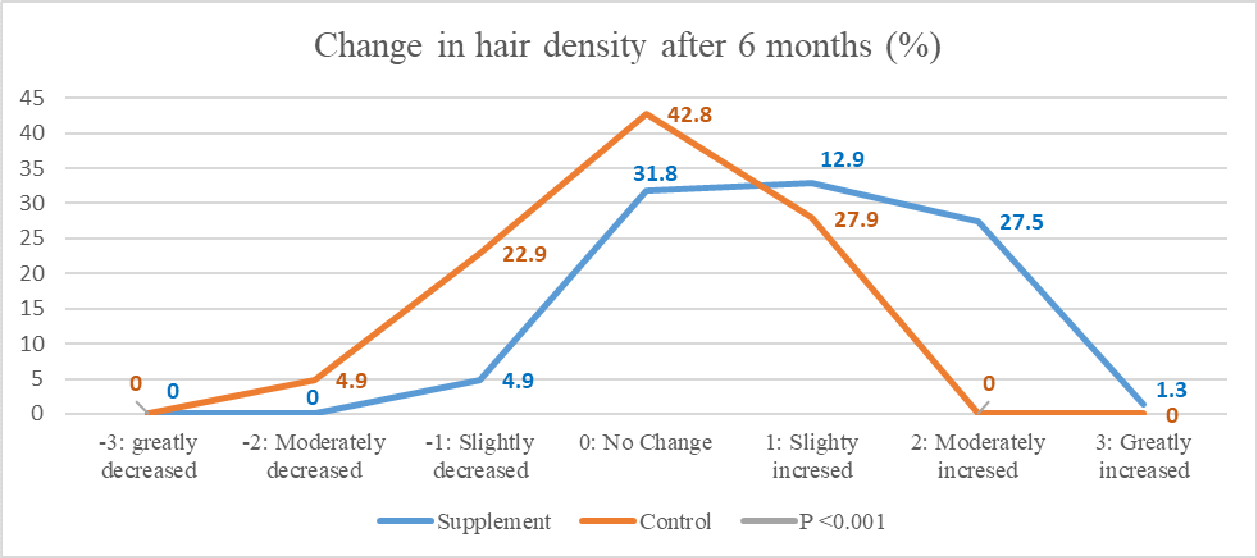

Figure1 Change in hair density after 6 months evaluated from photographs by the expert

Figure1 Change in hair density after 6 months evaluated from photographs by the expert where supplement of greatly decreased, Moderately decreased, Slightly decreased, No change, Slightly increased, Moderately increased and Greatly increased were 0, 0, 4.9, 31.8, 32.9,27.5 and 1.3 respectively. And control of greatly decreased, Moderately decreased, Slightly decreased, No change, Slightly increased, Moderately increased and Greatly increased were 0, 4.9, 22.9, 42.8, 27.9, 0 and 0.

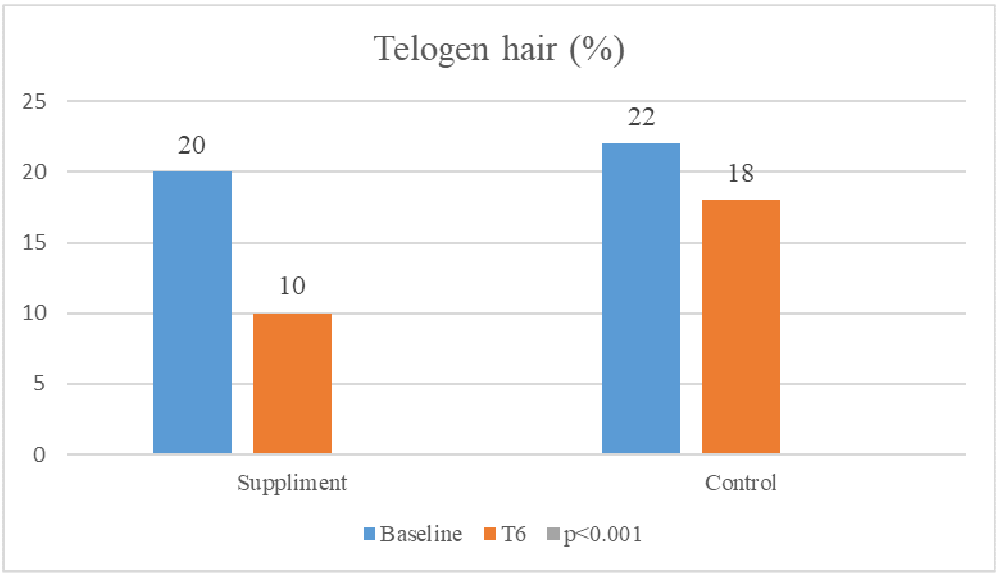

Figure-2 Telogen hair proportion (% of plucked hair) at baseline and after 6 months.

Figure 2 Telogen hair proportion (% of plucked hair) at baseline and after 6 months. **Indicates a statistically significant change compared to baseline, $P < 0.001$. Indicates the statistically significant greater change from baseline in the supplemented group compared to the change from baseline in the control group, $P < 0.001$.

DISCUSSION

There is a clinical correlation between omega-3 PUFA supplementation and health advantages in fundamental care and in the prevention of pathological states on various organs systems. Hair loss/ hair disorders have multifactorial etiology [5]. It is commonly accepted that 5α Reductase activity is not the only pivotal point in hair pathology; indeed, follicular micro inflammation, oxidation and microcirculation at the hair bulb are the leading causes of these conditions [9]. Furthermore, the lack of immunity or nutritional deficiencies can increase the seriousness or enhance the disorders [10]. In our study, according to the characteristics of women after supplement of age, BMI, Telogen hair were 47.6±10.2, 20.9±2.3, 20. ±4.1. And Control group of Age, BMI, Telogen hair were 45.3±14.3, 19.8±2.5, 21.1±3.4.

A nutritional supplement working on just one thing of this complicated pathology is not enough. A system carrying omega 3-6 fatty acids, antioxidant, phytosterols and vitamins can strategy the multifactorial nature of this problem. Omega-3 and omega-6 have been analyzing for their potential activity on hair loss and hair circumstance for more 20 years [11]. They are mentioned to exert an anti-oxidant activity and to reduce inflammation via directly influencing the arachidonic cascade. Furthermore, via the incorporation into the cell membrane they give a huge assist to the cell growth, regeneration and tissue fluidity [12].

In this present study, according to the change in hair density after 6 months evaluated from photographs by the expert where supplement of greatly decreased, moderately decreased, slightly decreased, no change, slightly increased, moderately increased and greatly increased were 0, 0, 4.9, 31.8, 32.9,27.5 and 1.3 respectively. And control of greatly decreased, moderately decreased, slightly decreased, no change, slightly increased, moderately increased and greatly increased were 0, 4.9, 22.9, 42.8, 27.9, 0 and 0.

Omega-3 polyunsaturated fatty acid (PUFAs) and omega-6 (linolenic acid (LA) and γ-linolenic acid (GLA), which can be found in very high concentration in linen seeds, borage oil, Serenoa repens and wheat germ oil [13]. After 6 months of treatment, photograph assessment demonstrated a superior improvement in the supplemented group ($P < 0.001$). The telogen hair percentage was significantly ($P < 0.001$) reduced in the supplemented group. The proportion of non vellus anagen hair (>40 µm) increased compared to the control group. The trichometer index increased in the supplemented group, while it decreased in the control group. A large majority of supplemented subjects reported a reduction in hair loss (89.9% of subjects at 6 months), as well as an improvement in hair diameter (86.1%) and hair density (87.3%) [14].

CONCLUSION

The efficacy of omega-3 supplementation is definitely beneficial in Telogen effluvium which commonly influences 30- to 60-year-old women, begins suddenly with or without a recognizable initiating factor. A 6-month supplementation with omega-3 acts efficiently against hair loss in improving hair density and reducing the telogen percentage and the proportion of miniaturized anagen hair.

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