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Estimation of levels of vitamin E in grade II & III haemorrhoids: A prospective study

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Abstract--Objective: The aim and objective of the study is to estimate the levels of vitamin E in blood in grade II & III haemorrhoid patients. Methods: This study was a prospective observational study carried out in Chennai private hospital for a period of 4 months. Institutional Ethical Committee (VISTAS-SPS/IEC/VII/2020/06) approval was obtained before conducting the study. A total of 70 subjects were enrolled based on the inclusion and exclusion criteria and were randomized into 2 groups Group 1 includes healthy volunteers and Group 2 includes haemorrhoid patients. By observing the vitamin E levels in both the groups, the role of vitamin E in haemorrhoids is determined. Results: In total, 70 patients were randomized into Group 1 and Group 2 with 35 patients each. Among 70 patients 40 patients were males and 30 patients were females. In that 18 patients in age group 18-25 years, 26 patients in age group 26-35 years, 20 patients in age group 36-45 years and 6 patients were above 45 years of age. The vitamin E levels were determined which showed an average of 12.15 in Group 1 males whereas 5.56 in Group 2 males and 10.3 in Group 1 females whereas 4.8 in Group 2 females. Conclusion: Our study concluded that vitamin E levels are reduced in haemorrhoid patients when compared to healthy volunteers. Hence, Vitamin E plays an important role in the management of haemorrhoids.

Keywords--haemorrhoids, healthy volunteers, alpha-tocopherol, reactive oxygen species, lipid peroxidation.

Introduction

Haemorrhoids are also known as piles, is a very common anorectal condition, which was defined as a symptomatic enlargement and distal displacement of normal anal cushions. These are vascular structures in the anal canal (1, 2). The natural evolution of haemorrhoids is benign, but they tend to get worse over time if not treated properly at right time (3, 4). Constipation, stress and prolonged straining are the major factors associated with the etiologies of haemorrhoidal development (5). Oxidative stress refers to imbalance between generations of reactive oxygen species (ROS) and activity of antioxidant defences (6). It can result from nutritional imbalance, chemical and physical agent exposure, hereditary disorders, injury or strenuous physical activities. Aging is also associated with oxidant production increase and decrease in the capacity to buffer oxidants which further results in a chronic state of oxidative stress (7). This can damage biomolecules (DNA, lipids and proteins), elevate apoptotic signaling, decrease muscle protein synthesis and protein degradation. Among many enzymes, Vitamin E has a unique place in the overall antioxidant defense (8). Vitamin E is a group of eight fat soluble compounds (four tocopherols and four tocotrienols). Vitamin E has a potent antioxidant with anti-inflammatory properties (9). Several lines of evidence suggest that among different forms of vitamin E, alpha-tocopherol (AT) has potential beneficial effects (10) as a protective effect by either preventing or reducing the oxidative damage. Vitamin E (lipid soluble) is known to prevent the chain reactions of the lipid peroxidation in cell membranes by interfering with the propagation of lipid free radicals.

ROS attacks PUFA in cell membrane which leads to a chain lipid peroxidation and fatty acids breakdown results in the formation of various modified oxidative products which are toxic to cells and finally converted into stable end product. The extent of peroxidative damage can estimate the stable end product of lipid peroxidation such as malondialdehyde (11). Alpha-Tocopherol protects against lipid peroxidation, and breaks the propagation by donating H atom to the chain carrying peroxy radical, thereby stopping the oxidation process (12).



Radical (nitric oxide) is biologically important molecule which is involved in a number of physiological processes. It can rapidly react with superoxide anion and produce more potent oxidant (peroxynitrite), which further initiates oxidation and nitration process (13, 14).



Aim and Objective

The aim and objective of the study is to estimate the levels of vitamin E in blood in grade II & III haemorrhoid patients.

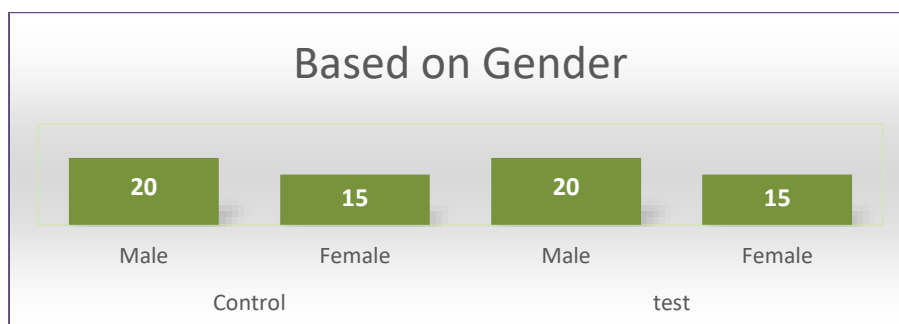
Materials and Methods

This study was a prospective observational study carried out in Chennai private hospital for a period of 4 months. Institutional Ethical Committee (VISTAS-SPS/IEC/VII/2020/06) approval was obtained before conducting the study. Before the enrollment of the subjects, the subjects were completely explained about the study and then the informed consent forms were signed. The subjects above 18 years of age and diagnosed with grade II and III haemorrhoids were included along with the healthy volunteers. The subjects deviating from the above inclusion criteria are excluded from the study. Total of 70 subjects were included and was categorized into 2 groups. Group 1 includes healthy volunteers and group 2 includes haemorrhoid patients. After observing the vitamin E levels in both the groups, the importance/role of vitamin E in haemorrhoids can be determined. The observed results were then calculated using SPSS software and also expressed in percentages.

Results and Discussion

This Prospective observational study was conducted for a period of 4 months from August 2021 to November 2021 in a Chennai private hospital. The enrolled subjects have signed the informed consent forms. A total of 70 subjects were included in the study and was categorized into two groups: Group 1 (healthy volunteers - 35) and Group 2 (haemorrhoid patients - 35). Among 70, males were 40 (20 in each group) and females were 30 (15 in each group) which was shown in figure 1.

Figure 1: Based on Gender

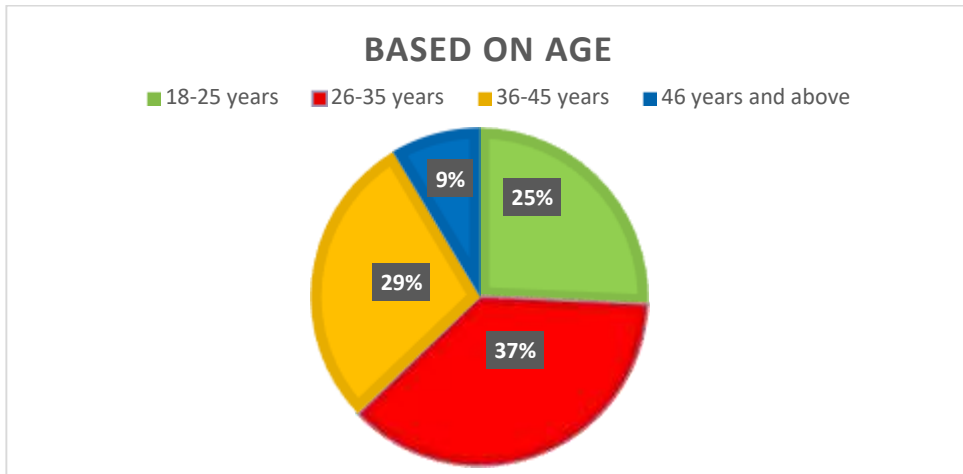


Out of 70 subjects, 18 were in the age group of 18 to 25 years, 26 were in the age group of 26 to 35 years, 20 were in the age group of 36 to 45 and 6 were in the age group of 46 years and above (Table 1 and Figure 2).

Table 1: Based on Age

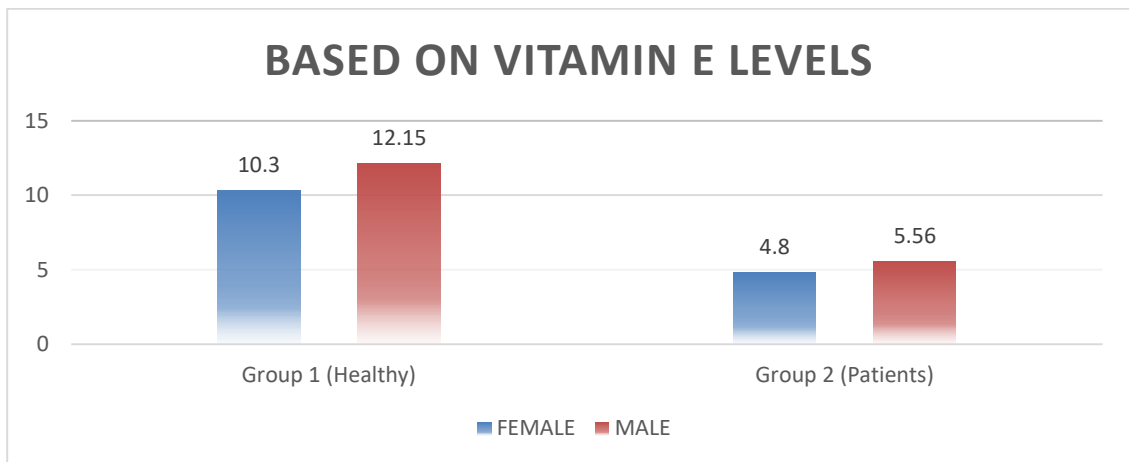
Age group	No. of subjects (n=70)	Percentage
18 – 25 years	18	25
26 – 35 years	26	37
36 – 45 years	20	29
45 years and above	6	9

Figure 2: Based on Age



Among the 70 subjects, vitamin E levels were determined which showed an average of 12.15 in Group 1 males whereas 5.56 in Group 2 males and 10.3 in Group 1 females whereas 4.8 in Group 2 females (Figure 3).

Figure 3: Based on vitamin E levels



Conclusion

Our study concluded that vitamin E levels are reduced in haemorrhoid patients when compared to healthy volunteers. Hence, Vitamin E plays an important role in the management of haemorrhoids. Further studies are being carried out where the vitamin E levels were observed in haemorrhoids patients who have received oral vitamin E supplementation along with standard treatment and standard treatment alone. Hence, furthermore studies are needed to support the existing data.

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