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Menopause and Haematological Changes: a case control study

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ABSTRACT

Background: Menopause is the natural cessation or stopping of a woman's menstrual cycle and marks the end of fertility. Ovarian function declines can lead to undesirable alterations in metabolism, vascular endothelium function, fibrinolytic and coagulative properties of blood. Menopause may enhance risk for ischemic heart disease in women due to such altered properties of blood and vascular function.

Aims and Objectives: To compare some haematological values in pre- and post-menopausal women to know the risk of vascular and ischemic heart disease in postmenopausal women.

Materials and Methods: Blood samples were drawn in 50 women who have attained menopause and have weight of 55–60 kg and height of 150–160 cm and 50 control subjects who were disease-free women aged 35–40 years with matching weight and height. These women had natural menopause and were not subjected to any hormonal or surgical intervention. The vital parameters were recorded, and general examination was done.

Results: There was a statistically significant increase in hematocrit, and there was no statistically significant change in platelet count, activated partial thromboplastin time (APTT), and prothrombin time (PT).

Conclusion: A higher viscosity of blood can enhance the risk of coronary artery disease by elevating platelet aggregability and adhesiveness to sub-endothelium. However, the above effect may partially be offset by unchanged APTT and PT.

KEY WORDS: Menopause, Haematological, Coronary Artery Disease, Estrogen, Hematocrit, Platelet, Subendothelium.

INTRODUCTION

Menopause is the natural cessation or stopping of a woman's menstrual cycle and marks the end of fertility. Most women experience menopause by around the age of 50 years, but pelvic or ovarian damage may cause sudden menopause earlier in life. Menopause is a point in time 12 months after a women's last period due to the stoppage of ovarian cycling. It is a natural process in the reproductive phase of women's life. Many changes take place in the physiological parameters after menopause like alterations in fat distribution and metabolism and also coagulative and fibrinolytic properties of blood [1], which may enhance the risk of vascular-related diseases such as cerebrovascular stroke and ischemic heart disease [2]. Endothelial dysfunction along with undesirable alteration in fibrinolysis, coagulation, and other metabolic processes has been known to occur [2].

An increase in the incidence of coronary heart disease risk has commonly been reported in postmenopausal women. The prevalence of hypertension, hypercholesterolaemia, hypertriglyceridaemia and atherogenic indices was significantly greater in postmenopausal women than in premenopausal women. High risk of coronary artery disease in post-menopausal women if they have coexisting lifestyle such as stress full work conditions, high calorie/high-fat diet, physical inactivity and habits like smoking, drinking etc. Identifying such changes at the right time can help them to prevent vascular-related complications and to adopt treatment if necessary.

Aims and Objectives: To find out haematological changes in women after menopause.

MATERIALS AND METHODS

The study conducted in Civil Hospital and B J Medical College in year of 2016 to 2018. Healthy 100 Volunteers women in age group of 35- 55 years have weight of 50–60 kg and height of 150–160 cm divided in two group according to menopause such as Group A: Premenopausal 50 women who were regularly menstruating, non-lactating, non- pregnant with no use of hormonal contraceptives for at least last 1 year and Group B: Postmenopausal 50 women who are at least 1-year amenorrhoic due to a natural cause without a hysterectomy or other procedure that would have stopped their menses. Women known cases of diabetes and hypertension, ischemic heart disease, surgically induced menopause such as oophorectomy, history of cerebrovascular disease or coronary artery disease, coagulopathies, thyroid diseases, recent history of jaundice, tuberculosis, blood transfusion etc. and medications known to affect the haematological values, habits related to tobacco chewing and smoking, drinking etc. were excluded from the study. The vital parameters were recorded, and general examination was done. Venous blood samples were collected from both the groups, and haematological values were measured by KX-21 Sysmex haematology analyser. Activated partial thromboplastin time (APTT) and prothrombin time (PT) were measured by coagulometer.

RESULTS

Total 100 included in Group A: Premenopausal 50 women and Group B: Postmenopausal 50 women.

Parameters	Group A: Premenopausal (n=50)	Group B: Postmenopausal (n=50)
Mean Age in years	43.8	52.6
Mean Height in cm	156.80	158.90
Mean weight in kg	57.6	58.9
Mean BMI	23.4	23.3

BMI – Body Mass Index

Mean age in Group A and in Group B respectively 43.8 and 52.6 years. Mean BMI in both groups almost same. [Table 1].

Parameters	Group A: Mean ±SD (n=50)	Group B: Mean ±SD (n=50)
Hb (gm%)	10.16±1.02	11.59±1.23
WBC (*10^6/L)	5620±250	6480±340
Hct %	34.95±2.34	37.28±2.67
APC (lakhs/cumm)	3.10±0.35	2.76±0.46
APTT (s)	27.94±1.02	28.26±1.34
PT (s)	18.96±1.12	18.45±1.27
INR	1.28±0.12	1.34±0.18

Hb- Haemoglobin, WBC- white blood cell, Hct- Hematocrit, APC- platelet count, APTT- Activated partial thromboplastin time, PT- Prothrombin time, INR- International normalized ratio, SD- Standard deviation

Haemoglobin and total white blood cell count level in Group B more than group A. Hematocrit (Hct) level in Group A and Group B as 34.95±2.34 and 37.28±2.67 respectively which shows it more in Group B. APC (Platelet Count) in both Group A and Group B as 3.10±0.35 and 2.76±0.46 lakhs/cumm respectively shows more in Group A. APTT, PT and INR almost same in both groups.

DISCUSSION

Haemoglobin level more in Group B in postmenopausal women due to cessation of menstruation [3]. Estrogen has long been associated with the inhibition of erythropoiesis and a diminished level of this hormone was to be associated with increase haemoglobin level [4]. Total WBC count more in postmenopausal may be explained by peripheral mobilization of leukocytes as part of the acute stress of menstruation [5].

Hematocrit (Hct) value greater in Group B while APC was lesser in Group B which correlate with Kharab S [6]. Higher Hct level may enhance red blood cell aggregation and raised viscosity causes platelet adhesiveness to the subendothelial and high protein exudation through vessels wall may promote atherosclerotic tendency.

Platelet count were normal in both groups but lesser in Group B which correlate with Butkiewicz et al [7]. In Postmenopausal women due reduced concentration of oestrogen may be probabale cause of low platelet count. There is an inverse relationship between serum ferritin and platelets. Due to the cessation of bleeding, serum ferritin stores were increased and platelet count decreased [8]. Carter JM et al. [9] and Stevens RF et al [10] also showed decreased platelet count in menopause. Platelet count was in normal range in both groups which might not have affected APTT, PT, and INR values which correlated with Kulkarni M et al [11].

CONCLUSION

Postmenopausal women had lack of estrogen and/or increasing age led to high viscosity of blood causes more platelet adhesiveness to subendothelium which signifies a phase of higher risk of vascular- related diseases such as stroke and ischemic heart disease

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