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A STUDY OF HEMATOLOGICAL PARAMETERS IN AN OLD AGE HOME IN SUB-HIMALAYAN REGION OF WEST BENGAL

Physiology

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ABSTRACT

This study was intended to assess the different blood parameters of the inmates of an old age home situated nearby to North Bengal Medical College. Estimation of Serum lipid profile, fasting blood glucose, urea, creatinine, uric acid, were done from the blood collected from a total number of 66(33 male and 33 female) inmates of the old age home. In our observation among 66 subjects; Mean value ± SD of serum Cholesterol, serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose serum urea, creatinine and uric acid were 163.48±28.012, 132.91±78.206, 43.515±8.868,100.06±25.09,2.36±0.71,110.6 36±41.86, 33.015±10.79 ,0.988±0.22, and 5.122±1.32 respectively.

All the blood parameters were estimated separately in 33 male and 33 female .There Mean value ± SD values of total Cholesterol, serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood gucocse serum urea, uric acid and creatinine, in case of male were 108±4.793, 56±76.76049, 30±5.395705, 56±27.80281, 2.497±0.823, 78±22.87619, 10±9.120511,3±1.509164 and 0.7±0.232859 respectively; where as in case of female mean value ± SD of serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose serum urea, uric acid and creatinine were 97±28.49206, 43±80.6779,28±10. 49603,49±22.42969, 2.224±0.546,79±55.10503, 16±12.36687 , 2.8±1.114377, and 0.7±0.21497 respectively. Comparative study was done among respective values of male and female and no statistically significant difference were found($p > 0.05$) between each respective values of male and female though all the values of male were slightly higher than those of female. More over all the parameters were near to normal value similar to that age group.

It may be concluded from this study that after certain age there occurs little differences in the blood parameters between male and female and it remain almost near to normal except in severe deterioration of body function due to gross organ damage[1]

KEYWORDS

North Bengal, Old age home, Ageing, Hematological Parameters, Significance

Introduction:

There is a projection from Word Health Organization that by 2050; 25 percent of the world's populations will be over 60 years[2] .As a natural physiological process with the advancement of age, there is a progressive deterioration of the body function as well as decline in physiological reserve of all the internal organ system. By the process of homeostasis body try to balance the changes as an attempt to restore the body function to normalcy.But with the passage of life, ultimately a time arrives when the homeostatic mechanism fails and all the animal including human being succumbs to death.[3] In the present scenario common causes of mortalities are cardiovascular events, respiratory diseases, renal failure and most of these may arise as a complication of long standing Diabetes Mellitus, dyslipidemia, hyperuricemia and other factors of metabolic syndrome[4].

Life in this modern era has become competitive, first and stressful. The concept of joint family has almost disappeared from our modern dictionary which has been replaced by nuclear family..Often our helpless old members of the family are pushed to old age home, under the care of unknown caretaker..Their near and dear relatives visit them occasionally like unknown visitors. These helpless old people in old age home get little general and medical care which they actually should get from their own family members during their terminal days of life. From this corner of thought we planned to do a study in an old age home and selected the subjects from the inmates of old age home to find out their potential risk of probable disease which may lead to death. Cardiovascular disease is the most common underlying condition in older people[5].

We studied their lipid profile, fasting blood glucose, serum urea, creatinine and uric acid which are common variable leading to morbidity and mortality in their terminal period of life. One of the main risk factors for cardiovascular disease is The LDL-Cholesterol, which is involved in the formation and destabilization of atheromatous plaques leading to coronary heart disease[6].

Changes in physiological system for a long time in life; causes an impairment of regulating function in many systemic organs which is reflected in alteration of laboratory investigation parameters. With the age related decline in the function of the different organs like cardiac ,pulmonary,renal,and metabolic function there also reflective changes in different laboratory parameters which help in clinching the diagnosis.

Few patients may show abnormal blood parameters in few specific test and few test value may observed more frequently than others which may be out of the line in healthy elderly people.

In this study we selected a group of people from and old age home of North Bengal and estimation of their few blood parameters were done to find out any difference between male and female inmates if any and whether they differ from normal values.

Aims and Objective: The aim of this population-based study was to find out age-related changes in few blood parameters like total serum Cholesterol,serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose, serum urea, uric acid and creatinine of elderly old age home-dwelling subjects, who are not using any medications.

Material and Methods: This prospective cross sectional study was conducted in the Department of Physiology in collaboration with the

Department of Biochemistry at North Bengal Medical College, in Darjeeling District of West Bengal. The study duration was of six months and sample size was 66(33 male and 33 female subjects). Both male and female inmates of the old age home were included in the study. Fully automated analyzer; Transasia XL-600 Model was used for estimation of blood parameters in this study.

After clinical evaluation few inmates were excluded from the study. Blood sample were collected after overnight fast and sample sent quickly to Biochemistry Laboratory.

Inclusion Criteria: Healthy subjects, in the age group of 40-80 years, maintaining a normal lively hood under the supervision of home authority were taken in these studies.

Exclusion Criteria: Ill person taking different medicine for their ailments were not taken in this study group. They were not hypertensive nor having heart disease or any other systemic illness.

Result and analysis: A total of 66 subjects (n=33 male and 33 female) were selected with in similar age group (male age- 65.52±1.641, female age- 62.67±1.64; p value 0.224 >0.05; insignificant).Total Cholesterol, Triglyceride, HDL Cholesterol, LDL Cholesterol LDL/HDL Cholesterol ratio, Serum Fasting Glucose, Serum Urea, Creatinine, Serum Uric acid were estimated and recorded as Mean ± Standard Deviation (SD) in a tabulated manner in Table-1. One way ANOVA was used in analyzing the data across the two groups. Considering male and female together Mean value ± SD of serum Cholesterol, serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose serum urea, creatinine and uric acid are 163.48±28. 012,132. 91±78. 206,43.515±8.868,100.06±25.09,2.36±0.71,110.636±41.86, 33.015±10.79 ,0.988±0.22, and 5.122±1.32 respectively.Table-2. It is seen that all the parameters are almost within normal limits except HDL cholesterol when shown separately in male and female; whch is less than the normal value. But there are study which states that plasma lipids increase with age in both males and females.[7].

Student's unpaired t-test was used to detect the level of significance within the groups. The probability value $p < 0.05$ considered as statistically significant difference between two data and probability value $p > 0.05$ considered as statistically insignificant.

Table-1: Over all Male and Female-Blood Parameters in Male and Female together expressed in mg/dl

Category	Cholesterol	Triglyceride	HDL-C	LDL-C	HDL/LDL Ratio	Fasing Blood Sugar -100	Urea-40	Creatinine	Uric Acid
Total No.	5	16	41	27	22	30	13	12	6
Percentage	7.5	24.34	62.12	40.91	33.33	45.45	19.70	18.18	9.09

Out of these total 66 subjects;5 numbers(7.5%)subjects were found blood cholesterol more than 200 mg/deciliter(dl),16 numbers(24.34%) found serum triglyceride more than 150 mg/dl,41 numbers(62.12%) HDL cholesterol less than 40 mg/dl,27 numbers(40.91%) serum LDL cholesterol more than 100 mg/dl,22 numbers(33.33%) HDL/LDL cholesterol ratio more than 2.5,30 numbers(45.55%) fasting blood sugar more than 100 mg/dl,13 numbers(19.70%) blood urea more than 40 mg/dl,12 numbers(18.18%) serum creatinine more than1.2 mg/dl and 6 numbers (9.09%) serum uric acid more than 7 mg/dl depicted in Table-1.

Table-2: Total and Percentile distribution of Blood Parameters all 66 subjects together.

	Serum Cholesterol	Triglyceride	S.HDL-C	S-LDL-C	HDL/LDL Ratio	Fasting Blood Sugar	Serum Urea	S.creatinine	Serum Uric Acid
Blood Value	163.48	132.91	43.515	100.06	2.36	110.636	33.015	0.988	5.122
SD	28.012	78.206	8.868	25.09	0.71	41.86	10.79	0.22	1.32
Mean±SD	163.48±28.012	132.91±78.20	43.515±8.86	100.06±25.09	2.36±0.71	110.636±41.8633	33.015±10.8	0.988±0.22	5.122±1.3

Table-3: Values of Blood parameters of 66 number of Male and Female inmates expressed as Mean+SD .

Blood Parameters	Male(Mean± SD)	Female(Mean± SD)	p-value	Normal value
Age	65.52±9.427	62.666±9.417	0.224	-
Total Cholesterol	108±27.536	97±28.49206	0.116	<200mg/dl
Serum Triglyceride	56±76.76049	43±80.67796	0.505	<150mg dl
HDL Cholesterol	30±5.395705	28±10.49603	0.334	>40mg/dl
LDL Cholesterol	56±27.80281	49±22.42969	0.265	<100mg dl
LDL/HDL Ratio	2.497±0.823	2.224±0.546	0.117	< 2.5
Fasting Blood Sugar	78±22.87619	79±55.10503	0.924	65-95 mg/dl
Uric Acid	3±1.509164	2.8±1.114377	0.542	2.5-7 mg/dl
Serum Creatinine	0.7±0.232859	0.7±0.21497	1.000	0.8-1.2mg/dl
Serum Urea	10±9.120511	16±12.36687	0.266	15-40 mg/dl

Values of Blood parameters expressed as Mean + Standard Deviation (SD), and p value. P-value < 0.05 was considered significant and p value > 0.05 were considered insignificant. Normal value were taken as reference from Harrisons Principle of Internal Medicine; 18th Edition, Volume-2

Mean+ SD values of total Cholesterol, serum Triglyceride, serum HDL Cholesterol, LDL Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose serum urea, uric acid and creatinine, in case of male are 108+4.793,56+76.76049, 30+5.395705, 56+27.80281, 2.497+0.823, 78+22.87619, 3+1.509164 and 0.7+0.232859 respectively . Where as in case of female mean value + SD of serum Total cholesterol, Triglyceride, serum HDL- Cholesterol, LDL-Cholesterol, LDL/HDL cholesterol Ratio, fasting blood glucose serum urea, uric acid and creatinine are 97+28.49206 43+80.6779,28+10.49603,49+22.42969, 2.224+0.546,79+55.10503,2.8+1.114377, 16+12.36687,0.7+0.21497 respectively.

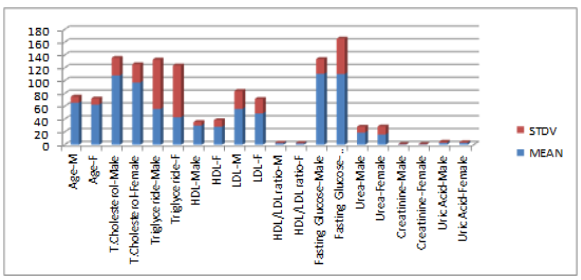

Figure-1: Comparison of different hematological parameters among males and female inmates as Mean + SD.

It is seen from these observations that all the mean value + SD are higher in case of male than those values of female though none of these blood parameters are significantly higher in case male than those of female because in each case p vale is more than 0.05(P > 0.05).

Serum HDL cholesterol mean value in case male is more than the female which is contrary to the sex distribution value of this parameters .It is less than the desirable normal value in both the case of male and female subjects which should be > 40 mg /dl and preferably female having higher value.

In several cross-sectional.[8] and prospective.[9] study it was observed that total cholesterol and LDL-cholestero gradually increases after adolescence until the age of 60-65 years in men and 70-75 years in women and there after start to decline. HDL-cholesterol tends to be higher in old age group.[10].

Discussion:

The cardiovascular diseases are considered one of the main causes of mortality affecting mainly elderly individuals.[11]. To have a longer expectancy of life one have to understand the normal physiology of aging so that quality of life can be improved and sustained .By maintaining a physiological function a good health can be achieved which will reduce medical burden from older people and society who consume a major part of medical services. Aging should not be considered a disease but a cause of increased occurrence of disease. Physiologist may play a vital role in developing and test hypothesis how human physiology is affected by genetic, molecular and cellular mechanism of aging which differ individual to individual. Cost of medicine is increasing day by day. It is increasing concern among older people and their service provider for constant re-evaluation and designing programme to help elderly people with limited expenses. Clinical diagnosis is more difficult in older people as they give poor history. So the attending physician has to depend on investigation and hematological parameters which have immense role for diagnosis .Our aim of this study was also to know the various hematological parameters by which it can be determined, changes in the internal organs; as an effect of aging as early as possible and thereby extending their life span as well as decreasing their morbidly and mortality. In our study we found the estimated blood parameters are almost within normal limit but these results are contradictory to few other study who reported a high frequency of dyslipidemia in adult person of both sexes without drug therapy[12]. Decline in reserve and compromises of homeostasis are secondary to aging process or may be related to poor dietary intake, obesity or sedentary life style. The HDL-C is considered very important for post-menopausal women[18], due to their cardio protective effect. Our study found HDL-C levels below recommended range and some study also observed HDL-C below desired value in their study[13].Though fasting blood glucose level increases with age with the decrease of glucose tolerance test but the value may remain in non-diabetic range but periodical checkup is necessary.. Renal threshold of glucose decrease as the age advance and consequently glucose may be detected in urine much below 200 mg/dl. With advancement of age; decline of organ function varies in person to person and system to system within one person. Despite, age related decline in cardiac, pulmonary, renal and metabolic function can be co-related with changes in laboratory values.

Conclusion:

Most prevalent cause of morbidity among older people is cardiovascular disease and dysregulation of lipid metabolism is known to impact several parameters of cardiovascular health[14]. Geriatric medicine has been given little importance before 1960. Later on an interest on this critical subject was given because increase in percentage of old age disease person and sharing of high percentage of nation's health care.But the important aspect like exercise, diet, personal habit and psychosocial factors continued to be under estimated. At this stage it is clear that not only the aging affect the laboratory values on blood profile screening but the abnormalities are usually due to underlying impairment of organ functions rather than aging process. So, periodical screening of hematological parameters of old age home people will not only increase the life expectancy of these old people, but also decrease the social burdens of disease as well as save their share of national health budgets. The international[15].and national[16]. Recommendations advise the decrease in LDL-C, considering its proven efficacy in decreasing mortality due to CVD[15] which ultimately reduces the incidence of further cardiovascular events, such as acute myocardial infarction[17] .

Our geriatric people should not be neglected and should not be left under the care of other people such as keeping in old age home. We the family member our self should care for our old family members. Wherever they may be, periodical medical check and routine investigations is must.

More elaborate studies are required in this domain involving more number of people, to obtain more information. Preventive measures should be taken to avoid their increased number of morbidity and mortality.

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