

Factors affecting coronary arterial disease, comparative study in male vs female

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Abstract- A current research is showing correlation between serum billirubin and coronary arterial disease. CAD is most common in man than in female. Because in this there is also one phenomena work behind it was level of serum billirubin which is maintain in female by estrogen where as in male there is no maintenances of S. billirubin this is lower in mail compare to female. Another risk factor also work in male rather than female is like smoking, diabetic or level of blood sugar and also B.M.I..

Keywords- CAD, Billirubin

Introduction

Coronary artery disease (CAD) is the end result of the accumulation of atheromatous plaques within the walls of the coronary arteries that supply the myocardium (the muscle of the heart) with oxygen and nutrients. It is sometimes also called coronary heart disease (CHD), but although CAD is the most common cause of CHD, it is not the only cause. It is most common in man rather than women. For many years, the bile pigment bilirubin was considered to be only a toxic waste product formed during heme catabolism. Recent research, however, suggests that bilirubin acts as a potent physiologic antioxidant that may provide important protection against arteriosclerosis, coronary artery disease (CAD), and inflammation. That's why it is been use to know the status of billirubin patients. Billiurubin is present low amount CAD male then the CAD female. Billirubin is an bile pigment produced from reticuloendothelial system. billirubin are divided in to two part in direct billirubin, which is circulates in the plasma bound to albumin, direct or conjugate billirubin which is water soluble and expected in urine. Importance of billirubin in our body is it percent in very low amount in body .Act as potent physiologic antioxidant that provide protection against arthrosclerosis , inflammation ,CAD It is use identify the liver disease like jaundice. It gives yellow pigmentation to serum.

Materials and methods

Blood and data collection

Blood collection is done from different laboratory of Gujarat and Maharashtra [A total of 53 patients, including 17 women, and 36 men presenting CAD were evaluated. Patients identified as suffering from CAD as per ECG test and the doctors' guidance. A data of their age, gender, SMOKING, profile was generated. BLOOD collection is done by different experts from repeated institutes.

Blood serum billirubin testing

Separate serum from blood with centrifugation. Perform biochemical test for billirubin shown as under. Take 1.8 ML distilled water in one clean test tube add 0.2 ML test serum I n teat tube containg water then add 0.5 ML diazo reagent. Incubate it in dark for 30 min take od at 540nm .that results are direct billirubin. In case of total bilirubin add 2.5 ml of methanol to the test tube keep it for incubation and take the od at 540. put three set of each test one for blank second for standard and third for test sample . Calculate level of billirubin.

$$\text{Total billirubin (mg/dl)} = \frac{\text{OD of total test- OD of blank}}{\text{OD of standard}} \times 10$$

$$\text{Direct billirubin (mg/dl)} = \frac{\text{OD of direct test} - \text{OD of blank}}{\text{OD of standard}} \times 10$$

$$\text{Indirect billirubin (mg/dl)} = \text{Total billirubin} - \text{direct billirubin.}$$

Also perform SGPT analysis of all the patients but it dose not shows any correlation in results.

Bio-statistical analysis

Analyse data of the patients and draw bar chart and shows data analysis table.

Results

Data analysis of patient shows that coronary arterial disease is most common in male but not in female. The ratio for male: female are 3:1. Most of the patient are between the age 40-60 (median- 50). BMI ratio shows that high obese person has high rist of coronary arterial disease. BMI is not related sex but it is related C.A.D. Smoking may increases risk of CAD by increasing consumption of the endogenous antioxidant billirubin and present study sport statement that smoking is responsible for coronary arterial disease. As study shows males are more smoker then the female all most 60% patient are smoker which has more risk of coronary arterial disease than non smoker

person. LDL is also decrease in patients of C.A.D. but it is not done by us and data was not collected by us. As data shows diabetic patient has more risk factor for C.A.D. in male as dataq shows 64% of diabetic multiuse patients are suffering from C.A.D.

Table 1- Data analysis of cad patient

	Male	Female	Total
Patients	36	17	53
Smoking	22	2	24
Nonsmoking	14	15	19
Diabetic	24	7	31
Non Diabetic	12	10	22
BMI Ratio			
Thin	0	0	0
Normal	13	7	20
Fat	23	10	43

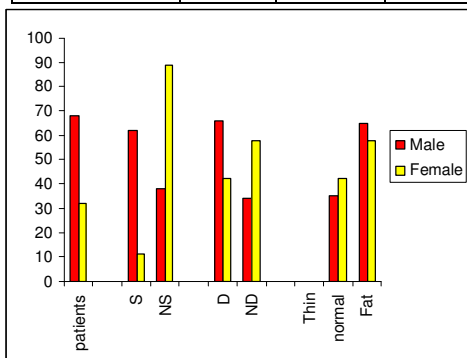


Fig.1- Data shows in bar chart

S= SMOKING
 NS= MO MSMOKING
 D = DIABITIC
 ND = NON DIABETIC

Bio Chemical Analysis

Obtain data of serum billirubin test shows that male patient has lower range of normal billirubin were as in female it is normal. Normal limit of total billirubin is up to 1.0 mg/dl. For direct and indirect billirubin is up to 0.5 mg/dl. But in rheumatoid patient it is shown that male patients total billirubin level is about less than 0.5 mg/dl. And it is maintained in female between 0.5 – 1.0 mg/dl. SGPT enzyme test shows no similarity in patient’s samples.

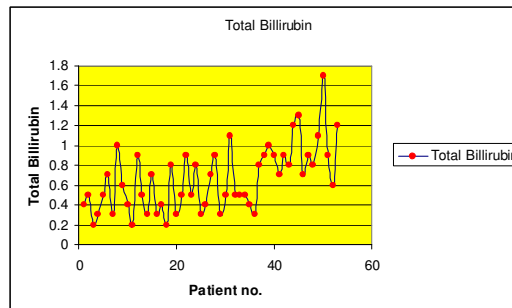


Fig. 2-Results of Total serum billirubin
 Note patient no 1-36 are male and 37-53 are female.

Discussion

The observations in our study confirm similar results in the Framingham Offspring Study cohort, reported previously by Djousse´ et al. (9) and Hunt et al. (10), who also reported an association of billirubin and CAD in men but not in women. Their results and ours contrast, however, with results reported by Hopkins et al. (6). We observed a 40% reduction in prevalence odds for CAD in males with billirubin values ≥ 8.0 mg/L independent of other risk factors. Similarly, Schwertner *et al.* (5) reported a comparable risk reduction resulting from a 50% increase in total billirubin. Explanation for the gender-related differences in total billirubin concentrations could be the different risk profiles found in males and females: 11% of the female CAD patients were smokers, whereas 60% of the male CAD patients smoked. Billirubin concentrations were significantly lower in smokers than in nonsmokers independent of sex, whereas we found no association between billirubin and the risk factors diabetes. This was also reported by Schwertner (17), who reported an inverse association between smoking and serum total billirubin concentrations in individuals with and without CAD. These findings are in accordance with our data and support the hypothesis that cigarette smoking may also increase the risk for CAD by increasing the consumption of the endogenous antioxidant billirubin. Nevertheless, the gender-related differences in serum billirubin concentrations remained statistically significant in a multivariate analysis after adjustment for smoking and other environmental risk factors, indicating that these findings are not exclusively determined by environmental cardiovascular risk factors. The observations in our study confirm similar results in the Framingham Offspring Study cohort, reported previously by Djousse´ et al. (9) and Hunt et al. (10), who also reported an association of billirubin and CAD in men but not in women. Their results and ours contrast, however, with results reported by Hopkins et al. (6). We observed a 40% reduction in prevalence odds for CAD in males with billirubin values ≥ 8.0 mg/L independent of other risk factors. Similarly,

Schwertner et al. (4) reported a comparable risk reduction resulting from a 50% increase in total bilirubin. The inclusion of bilirubin, alone or in combination with cholesterol/HDL ratios, as a potential predictive risk marker could help to identify individuals at risk for CAD as suggested by Mayer (3) and Schwertner and Fischer (16). However, all observed changes in median serum bilirubin were within the very narrow reference interval of total serum bilirubin (0–10 mg/L), and our data indicate that the association between serum bilirubin and CAD is restricted to males. Current study support the study of George et al. there is inter linkage between estrogen and serum bilirubin in C.A.D. which is done by George. The lower serum bilirubin in women may reflect the influence of estrogens (12), possibly related to increased bilirubin excretion by induction of UDP-glucuronyltransferase in the liver, as suggested in animal studies (13). Estrogens also decrease LDL and increase HDL, reduce the oxidation of LDL, and increase the local production of nitric oxide in the vascular wall (14). Thus, the potential proatherogenic effect of female sexual steroids via a decrease in serum bilirubin seems to be outweighed by the beneficial effects of estrogens. In our study, information concerning menopausal status, hormone replacement therapy, and oral contraception was not available. Thus, we currently cannot confirm this hypothesis.

Conclusion

The current study supports the reports that arthritis is 3 times more common in males than in females. It emphasizes that the frequency of C.A.D. increases with age and peaks in persons aged between 40-60 years. Cases of arthritis are mostly observed in obese or overweight people. Study supports that the patient having smoking background having high risk of coronary arterial disease. The study confirms that there is a relation between C.A.D. and serum bilirubin in male. Because in female serum bilirubin level is maintained by estrogens. However, there is a correlation between C.A.D. and serum bilirubin. It is also used as a diagnostic marker of C.A.D. causing substance, which helps to treat the patients and is the primary stage of C.A.D.

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