



ESTIMATION OF SERUM ALKALINE PHOSPHATASE AND SERUM CHOLESTEROL IN CASES OF CHRONIC BILIARY TRACT DISEASES AT DMCH, LAHERIASARAI, BIHAR

Pathology

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ABSTRACT

Diseases affecting the biliary tract are very frequent occurrence in our part of the country. The commonest type of chronic biliary tract disease, which we frequently encounter in surgical department of Darbhanga Medical College and Hospital is chronic cholecystitis with or without cholelithiasis and investigation were done at Pathology Department of DMC, Laheriasarai, Bihar. Other less frequent disease affecting the biliary tract are carcinoma of the gall bladder, carcinoma of the bile duct, cholesterosis, cholesterol polyposis and some congenital anomalies affecting the biliary tract. Cholecystectomy, a operative treatment for many of the chronic biliary tract disease is among the few major operation which is very frequently done in routine operation theatre of DMCH, Laheriasarai, Bihar.

Duration of the biliary tract disease are very variable. Since the biliary system and parenchymal cell of the liver are interdependent, so it is likely that a disease of the biliary system, particularly of long duration may cause morphological or even functional abnormality in the liver.

KEYWORDS

INTRODUCTION

Liver is a major organ of the body. This is a site for synthesis, degradation and excretion of the many plasma constituent including enzymes. Any derangement of functional status of liver due to some pathological process may reflect in term of abnormal concentration of those plasma constituent and enzymes. By estimating these plasma constituent we can assess the functional status of the liver.

Cholesterol and alkaline phosphatase are among the many plasma constituent, for which metabolism liver act as a central organ. Liver account for 50% of endogenous cholesterol synthesis inside the liver. Cholesterol can be incorporated into the lipoprotein, converted into the bile acid or excreted into the bile. Liver is also site for release of free cholesterol into the blood from cholesterol ester. Normal serum cholesterol is about 120 to 260mg/100ml.

Alkaline phosphatase found in almost all tissues. Normal serum contains alkaline phosphatase activity mainly derived from bone and liver and some lesser extent from intestine. Normal blood level of alkaline phosphatase is about 4 to 11 K.A. (King Armstrong) unit. Alkaline phosphatase in the liver cell is situated principally in canalicular and sinusoidal membrane. When hepatocyte are damaged relatively little alkaline phosphatase is liberated into the blood most probably coming from the cells which are killed. In hepatocellular disease either acute or chronic, alkaline phosphatase does not usually rises more than two and half fold. When the biliary tract is obstructed at any level new alkaline phosphatase synthesized in the hepatocyte membrane, much of which escape into the blood a greatly increased blood alkaline phosphatase activity is therefore the main indicator of biliary obstruction, though it does not give any information regarding the site of that obstruction.

Elevated serum cholesterol level in the pathogenesis of coronary heart disease has been extensively studied and it has become an established fact that plasma lipid abnormality, particularly high cholesterol is among one of the important etiological factor for the ischaemic coronary heart disease.

As coronary heart disease has proven relationship with serum cholesterol level and also coronary heart disease has relationship with gall bladder disease as commented by some authors, So gall bladder disease must have some relationship with serum cholesterol.

Moreover, cholesterol is a major constituent of the gall stone. Gall stones are of three type i.e. cholesterol gall stone pigment stone and mixed stone. Cholesterol stone consist almost entirely of cholesterol

and also in mixed stone it is a major constituent. In the pathogenesis of cholesterol stone cholesterol in the bile becomes excess relative to bile salt and phospholipids, thus allowing the serum cholesterol crystal to form. Bile cholesterol increase with age and raised in woman, particularly those taking the contraceptive pill, a recognized risk factor for gall stone formation.

In cholesterosis (Strawberry gall bladder), a type of chronic biliary tract disease for which cholecystectomy is indicated, there is submucous aggregation of cholesterol crystal and cholesterol ester inside the gall bladder. Cholesterol polyposis of gall bladder is also a similar condition, Histologically cholesterol polyposis similar to the cholesterol laden projection of Strawberry gall bladder.

AIMS AND OBJECTIVES

In this present work my aim is to assess the value and limitation of estimation of serum cholesterol and serum alkaline phosphatase level in assessing the derangement in functional status of liver due to hepatocellular damage resulting from chronic biliary tract diseases, has the serum cholesterol and alkaline phosphatase level, any relationship with the incidence of chronic biliary tract disease?

MATERIAL & METHODS

MATERIAL:

The present study was conducted on patient admitted to the surgical ward of DMCH and the investigation was carried out in the department of pathology, DMC, Laheriasarai, Bihar.

Cases of chronic biliary tract disease were selected and diagnosis was established by clinical examination, radiological examination, ultrasound and other laboratory test. Finally diagnosis was confirmed by seeing laparotomy finding in most of the cases. Serum cholesterol and serum alkaline phosphatase were estimated and compared against the level of serum cholesterol and serum alkaline phosphatase estimated in normal subjects.

CLINICAL EXAMINATION OF THE PATIENT:

Complaint and history of present illness :

Past history :

Family history :

Personal history :

Physical examination :

Investigation :

Routine investigation : T.C. & D.C. of W.B.C., B.T., C.T., Haemoglobin, Iv. Urine routine examination, Blood sugar, Blood urea,

if indicated : Serum bilirubin

Special investigation : Plain X-ray abdomen Oral cholecystography, Ultrasonogram of the upper abdomen, Laparotomy findings

METHODS :

Apparatus :

1. 10 ml.A/G syringe with no. 12 needle.
2. Tourniquet.
3. Sterilized plain vial.

Separation of serum :

Serum cholesterol estimation :

RESULT :

Present work was designed to study the association of serum cholesterol and serum alkaline phosphatase in cases of chronic biliary tract disease. Does serum cholesterol and serum alkaline phosphatase in cases of chronic biliary tract disease give any information regarding the functional status of liver due to hepatocellular damage resulting from chronic biliary tract disease?

Study was done on 75 cases of chronic biliary tract disease that was compared against the 25 normal subjects that was nearly similar in distribution, according to age, sex, social class etc.

Mean serum cholesterol level was increased in all the group of chronic biliary tract disease cases in comparison to control subjects, but this rise was not statistically significant, except in carcinoma of gall bladder group in which rise was statistically highly significant.

Mean serum alkaline phosphatase level also raised in all group of the chronic biliary tract disease, but it was statistically significant in choledocholithiasis and carcinoma of the gall bladder.

In choledocholithiasis, although rise in serum alkaline phosphatase statistically highly significant in all group of choledocholithiasis but mean value of serum alkaline phosphatase was more in group with jaundice than without jaundice group.

In cases of carcinoma of the gall bladder serum alkaline phosphatase was significantly raised in comparison to control subjects, more so in carcinoma of gall bladder with hepatic involvement.

CONCLUSION :

Serum cholesterol level has no relationship with the chronic biliary tract diseases except in carcinoma of gall bladder with or without hepatic involvement. But in this series we had found only three cases of carcinoma of gall bladder so with such small number of cases we can't conclude anything confidently.

Estimation of serum cholesterol to know the functional status of liver in cases of chronic biliary tract diseases is useless.

Estimation of serum alkaline phosphatase is of value in cases of choledocholithiasis and carcinoma of gall bladder with or without hepatic involvement. In these cases it indicate functional status of the liver.

In other cases of chronic biliary tract disease like acalculous cholecystitis, calculous cholecystitis without evidence of biliary obstruction, empyema of the gall bladder and mucocele of the gall bladder, estimation of serum alkaline phosphatase is of no value because in these cases either liver is not damaged or if damaged, damaged is not to such extent to impair the functional reserve of liver.

Significant increase in level of serum cholesterol in chronic biliary tract disease is associated with carcinoma of the gall bladder with or without hepatic involvement, this facts should be further evaluated in more cases of carcinoma of the gall bladder.

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