

## ABSTRACT

# The role of Hyperbilirubinemia as a predictor of gangrenous or perforated appendicitis

### BACKGROUND:

Acute appendicitis is the commonest cause of “Acute Surgical abdomen”. Appendectomy is the most frequently performed urgent abdominal operation and is often the first major procedure performed by a surgeon in training.

The diagnosis of Appendicitis still remains a dilemma in spite of advances in the radiological and laboratory investigations. Experienced clinicians accurately diagnose appendicitis based on a combination of history, physical examination and laboratory studies about 80% of the time. Although most patients with Acute Appendicitis can be easily diagnosed, in some cases the sign and symptoms are variable and a firm diagnosis can be difficult. This is particularly true where the appendix is retrocaecal or retroileal. The percentage of appendectomies performed where appendix subsequently found to be normal varies 15- 50% and postoperative complications can occur in up to 50% of these patients. Delay in diagnosis of Acute Appendicitis leads to perforation and peritonitis and increased mortality.

A safe alternative seems to be appendectomy as soon as the condition is suspected a strategy that increases the number of unnecessary appendectomies. A timelier and more accurate diagnosis has been attempted by the employment of additional laboratory tests, scoring systems, ultrasound imaging , computed tomography (CT) scan , scintigraphy, MRI , and laparoscopy. None of these methods stands alone as they all come in support of, and are secondary to a primary clinical assessment

Hyperbilirubinemia is a new diagnostic tool for perforation of appendix. Hyperbilirubinemia is the result of imbalance between production and excretion of bilirubin by the liver. Portal blood carries nutrients and other substances absorbed from gut including bacteria and its product (toxins). It is commonly cleared by detoxification and immunological action of the reticuloendothelial system of the liver that acts as first-line defense in clearing toxic substances, bacteria and its products. But when bacterial load overwhelms the Kupffer cell function, it may cause dysfunction or damage to hepatocytes (liver parenchyma). It reflects a rise in serum bilirubin (SB) alone or in combination with liver enzymes depending upon the type, severity and site of the lesion

## AIM:

To establish the role of hyperbilirubinemia as a diagnostic tool to predict gangrenous/perforated appendicitis.

## OBJECTIVES:

1. To study the relationship between hyperbilirubinemia and acute appendicitis.
2. To evaluate whether elevated bilirubin levels have a predictive potential for the diagnosis of appendicular perforation.
3. To compare other variables such as age, duration of symptoms, clinical profile, white blood cell count, C-reactive protein and ultrasound in a similar role.

## METHODOLOGY AND TECHNIQUES

- **Study Design:**

100 patients admitted in Coimbatore Medical College and Hospital for acute appendicitis and undergoing emergency appendectomy.

- **Study Place:**

Coimbatore Medical College and Hospital.

- **Study Design:**

Prospective, non-randomized, observational study

- **Sample Size:**

100 patients

- **Study Period:**

September 2013 – September 2014

- **INCLUSION CRITERIA**

- All Patients with acute appendicitis

- **EXCLUSION CRITERIA**

1. Patients aged below 13 years
2. Patients with Past history of
  - a. Jaundice
  - b. Hemolytic anemia
  - c. Chronic alcoholism
3. Patients with GI malignancies
4. Patients positive for HbsAg

All the patients included in the study shall be evaluated to a thorough history and physical examination In addition to routine blood and urine investigations.

1. Routine blood investigations (Complete blood count, platelet count, reticulocyte count).
2. Peripheral smear to rule out hemolytic anemia.
3. Serum Bilirubin (Total and Direct bilirubin)
4. Liver Function Tests (LFTs) which include;
5. Seropositivity for HbsAg
6. Urine analysis (routine and microscopy)
7. USG Abdomen

## Observation and results:

Mean age of the study population was 25.74 years with more males than females in ratio of 1.6:1.

Majority of the patients were in 13 to 20 years group in females, 21-30 group in males.

Mean total serum bilirubin of all 100 was elevated minimally above normal range, there was significant total serum bilirubin elevation among patients with perforated or gangrenous appendix.

Liver enzymes- SGOT & SGPT were within normal limit in most of patients, minimally to moderately elevated in 35% and 23% of all patients. ALP was elevated minimally (<2 times) in 11% of all patients. Most of the patients with elevated liver enzymes belong to perforated or gangrenous group.

Total leucocyte count was elevated in majority of patients with acute appendicitis. The cell type was predominantly neutrophils.

Hyperbilirubinemia was observed in most of patients with perforated or gangrenous appendicitis.

Hyperbilirubinemia was found to be 83.34% sensitive and 67% specific in detecting perforated or gangrenous appendicitis.

Cut off value for total serum bilirubin was calculated to be >1.050mg/dL which was 66.7% sensitive and 65.9% specific in detecting gangrenous or perforated appendix.

## Conclusions:

Our study concludes that

- Total serum bilirubin was significantly elevated in patients with gangrenous and perforated appendicitis than those with acute appendicitis.
- Total serum bilirubin level as a test for predicting gangrenous or perforated appendicitis is a highly sensitive, less specific with a high negative predictive value.
- Hence it is a valuable indicator in patients likely to have perforated or gangrenous appendicitis. Total serum bilirubin should be used along with clinical examination and other laboratory investigations in the assessment of patients suspected of appendicitis.

Key words: perforated appendix, gangrenous appendix, hyperbilirubinemia,