



CLINICO-EPIDEMIOLOGICAL PROFILE OF ULCERATIVE COLITIS AND RELATIONSHIP BETWEEN SERUM BILIRUBIN LEVEL AND SEVERITY OF ULCERATIVE COLITIS IN A TERTIARY CARE HOSPITAL IN SOUTHERN INDIA

Gastroenterology

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ABSTRACT

INTRODUCTION: Inflammatory Bowel Disease is characterized by chronic or relapsing immune activation and inflammation within the gastrointestinal tract (GIT). Crohn's Disease (CD) and Ulcerative Colitis (UC) are the two major forms of IBD. Increased reactive oxygen species production in IBD is likely to be responsible for the increased consumption of bilirubin in these patients, leading to intestinal injury. Several previous studies have found reduced bilirubin levels in IBD. **AIM:** To study clinico-epidemiological profile of ulcerative colitis and relationship between serum bilirubin level and severity of ulcerative colitis. **MATERIALS AND METHODS:** Thirty consecutive patients of ulcerative colitis were included in the study over a period of one year. Epidemiological profile, risk factors, presenting symptoms, disease severity by modified Truelove and Witt's criteria classification and extra-intestinal manifestations were studied. Serum bilirubin, ESR and Hb levels recorded. Severity of UC in relation with Serum Bilirubin levels was analyzed. **RESULTS:** Disease was mild in majority (53.3%) followed by moderate (33.3%) and severe (13.3%) according to Modified Truelove and Witt's criteria. Those patients with severe UC had low serum bilirubin (mean 0.55) compared to patients with mild (mean 0.71) and moderate (0.61) disease. Severity of UC negatively correlated with serum bilirubin levels with significance ($p=0.046$) in our study. Difference in serum bilirubin levels was more significant between mild and severe disease ($p=0.034$) when compared with mild to moderate ($p=0.061$) and moderate to severe disease ($p=0.442$). ESR levels were negatively correlated with serum bilirubin levels ($p=0.003$). **CONCLUSION:** Serum bilirubin levels were negatively correlated with severity of Ulcerative colitis and ESR levels.

KEYWORDS

INFLAMMATORY BOWEL DISEASE, ULCERATIVE COLITIS, SERUM BILIRUBIN

INTRODUCTION

Inflammatory Bowel Disease is characterised by chronic or relapsing immune activation and inflammation within the gastrointestinal tract (GIT). Crohn's Disease (CD) and Ulcerative Colitis (UC) are the two major forms of IBD.¹ UC is a condition in which the inflammatory response and morphologic changes remain confined to the colon and rectum with rectum involved in 95% of patients. Major symptoms are diarrhoea, rectal bleeding, tenesmus, passage of mucus and cramping abdominal pain. CD in contrast to UC can involve any part of the GIT from oropharynx to the perianal area.^{2,3} Diagnosis of IBD is usually established through a global assessment of the clinical presentation, radiographic, endoscopic and pathologic findings.⁴ Many studies have been published from different parts of world, but more data is required from India to study the disease course. Previous Indian studies suggested low incidence of the disease and a milder disease pattern. However, subsequent reports in the late nineties have reported more aggressive course of the disease.⁵

Chronic colonic inflammation of IBD is associated with increased oxidative stress and disruption of the intestinal homeostasis.^{6,7,8} Bilirubin is one of the most potent endogenous antioxidants, which plays an important role in lipid per-oxidation prevention.⁹⁻¹² Increased reactive oxygen species production in IBD is likely to be responsible for the increased consumption of bilirubin in these patients, leading to intestinal injury.⁹⁻¹² Several previous studies have found reduced bilirubin levels in IBD.

In this study we analyzed the relation between serum bilirubin levels and severity of Ulcerative colitis.

MATERIALS AND METHODS

This is a prospective observational study conducted in department of Medical Gastroenterology at Stanley Medical College, Chennai from

November 2020 to October 2021. Biopsy proven cases of Ulcerative colitis attending the department were included in the study.

Exclusion criteria included Patients with diseases that affect serum bilirubin levels like liver and biliary tract disease, tumors of colon, small intestine, anemia, hemochromatosis, autoimmune diseases, hypertension, coronary heart disease, diabetes and cerebral infarction.

A total of 30 biopsy proven ulcerative colitis patients were included in the study. Epidemiological profile, risk factors, presenting symptoms, disease severity by modified Truelove and Witt's criteria and extra-intestinal manifestations were studied. Serum bilirubin, ESR and Hb levels recorded. Severity of UC in relation with Serum Bilirubin levels was analyzed.

Statistical analysis was done using IBM SPSS Statistics 25 software.

RESULTS:

A total of 30 consecutive patients with Ulcerative colitis were included in this study. Majority were females (66.6%). Most of the patients belonged to 20-40 years age group (53.3%) followed by 40-60 years (43.3%). Age at onset in majority of patients was between 20-40 years (56.6%) followed by <20 years (23.3%) and 40-60 years (20%).

Diarrhea was most common complaint with bloody stools noted in 87% patients. Next common complaints were urgency (83.5%), tenesmus (83.5%) and abdominal pain (66.6%).

Risk factors like oral contraceptive pill usage or family history is not seen in any of the patients. None of the patients had history of appendectomy. Three patients were smokers which was thought to be protective factor for Ulcerative colitis. Extra intestinal manifestations like arthritis and joint pains seen in three patients

(10%). Disease was mild in majority (53.3%) followed by moderate (33.3%) and severe (13.3%) according to modified Truelove and Witt's scoring.

Those patients with severe UC has low serum bilirubin (mean 0.55) compared to patients with mild (mean 0.71) and moderate (0.61) disease. Severity of UC is negatively co related with serum bilirubin levels with significance ($p=0.046$) in our study. Difference in serum bilirubin levels was more significant between mild and severe disease ($p=0.034$) when compared with mild to moderate ($p=0.061$) and moderate to severe disease ($p=0.442$).

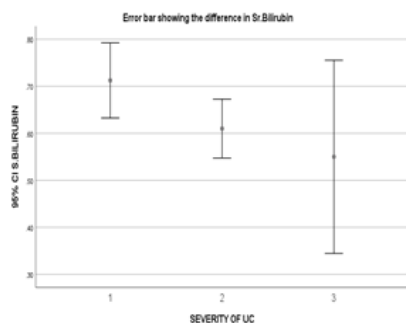


Figure 1. Error bar showing the difference in Serum bilirubin. X-axis Severity of UC 1-Mild, 2-Moderate, 3- severe.

		Correlations	
		ESR	S.BILIRUBIN
ESR	Pearson Correlation	1	-.520**
	Sig. (2-tailed)		.003
	N	30	30
S.BILIRUBIN	Pearson Correlation	-.520**	1
	Sig. (2-tailed)	.003	
	N	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2. Correlation between ESR and serum bilirubin.

		ANOVA				
		Sum of Squares	df	Mean Square	F	Sig.
S.BILIRUBIN	Between Groups	.117	2	.059	3.465	.046
	Within Groups	.457	27	.017		
	Total	.574	29			
ESR	Between Groups	2648.150	2	1324.075	12.471	.000
	Within Groups	2866.650	27	106.172		
	Total	5514.800	29			

Table 2. ONEWAY ANOVA

ESR levels were negatively correlated with serum bilirubin levels ($p=0.003$). Hemoglobin levels were negatively correlated with severity of UC ($p=0.357$) and positively with serum bilirubin levels ($p=0.160$).

DISCUSSION:

In European and North American studies UC incidence is equal in men and women.¹³ A male preponderance is seen in few Asian studies.¹⁴⁻¹⁶ But in this study more female preponderance is noted.

IBD in Western population is characteristically associated with bimodal age distribution pattern with a peak at age 20-39 years and a second smaller peak at 60-79 years. Such bimodal age distribution has not been consistently observed in Asian population.¹³⁻¹⁵ In this study age at onset was <20 years in 23.3%, 20-40 years in 56.6% and more than 40 years in 20% patients. It is consistent with other studies in Asian population.¹³⁻¹⁵

Most common symptoms observed in our study was bloody diarrhea

(87%), urgency and tenesmus (83.5%). It was similar to other studies on Ulcerative Colitis.^{13,14,15,16}

No female patient had history of oral contraceptives usage which was recognized risk factor for Ulcerative colitis. No patients in our study underwent appendectomy which was protective factor for Ulcerative colitis. History of smoking was noted in three patients.

Familial occurrence of IBD is common globally but an Indian study showed that only 2.9% individuals had a significant family history¹⁷. However in our study there was no significant family history for the individuals studied. According to this it can be inferred that familial occurrence is less in Indian population than in the Western countries.

Extra intestinal manifestations in the form of arthritis and joint pains was noted in 10% patients in our study. While previous reports from India have shown variable results^{18,19} the present study suggests that extra-intestinal symptoms are less common in Indian patients with UC.

Few studies demonstrated the association between Serum Total Bilirubin and migraine, DM, CKD, CVD. Recently it was reported that lower total bilirubin and Hb levels had a negative co-relation with severity of UC and CD²⁰.

In our study Serum total bilirubin levels were negatively correlated to severity of UC ($p=0.046$) similar to a study on Chinese population.²⁰ Patients with severe UC had low serum bilirubin (mean 0.55) compared to patients with mild (mean 0.71) and moderate (0.61) disease. Difference in serum bilirubin levels was more significant between mild and severe disease ($p=0.034$) when compared with mild to moderate ($p=0.061$) and moderate to severe disease ($p=0.442$).

Serum total bilirubin levels were also negatively correlated to ESR values ($p=0.003$). These results are consistent with another study from china²⁰ by Zhao x et al?

CONCLUSION:

Serum bilirubin levels were negatively correlated with severity of ulcerative colitis and serum ESR levels.

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