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RESEARCH ARTICLE

EVALUATION OF VALIDITY OF ULCERATIVE COLITIS ENDOSCOPIC INDEX OF SEVERITY (UCEIS)

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ABSTRACT

Ulcerative colitis (UC) is a chronic relapsing and remitting inflammatory disorder of the gastrointestinal tract that affects the large bowel. Currently, there is no single test that allows the diagnosis of UC with acceptable sensitivity and specificity. Clinical and laboratory parameters are helpful in monitoring disease activity.

Aim of the work: Was to evaluate the validity of Ulcerative Colitis Endoscopic Index of Severity (UCEIS) in the evaluation of Ulcerative Colitis.

Patients and Methods: Eighty patients with ulcerative colitis, who were subjected tohistory taking, clinical examination, laboratory investigations including acute phase reactants and fecalcalprotectin, colonoscopy and mucosal biopsies.

Results: There was a statistical significance betweenUCEIS final score and each of fecal calprotectin andhistopathological activity but not with Truelove and Witts activity index.There was no statistical significance between Mayo final score and each of fecal calprotectin, Truelove and Witts activity index andhistopathological activity index.

Conclusions: UCEIS is an easy index to be used in the evaluation of disease activity of UCas itclearly excludesvariability and applies precise definitions and significantly correlates with clinical, laboratory and histopathological markers of activity of UC.KEYWORDS: Ulcerative Colitis, UCEIS, inflammatory bowel disease, colonoscopy.

INTRODUCTION

Inflammatory bowel diseases (IBDs) are a group of inflammatory conditions of the colon and small intestine. The major types of IBDs are idiopathic IBD which includes Crohn's Disease (CD) and Ulcerative Colitis (UC), (Danese and Fiocci 2011, Kim *et al.,* 2012). The diagnosis of the two main forms is based on clinical presentations, endoscopic, histological features and radiological abnormalities (Lennard-Jones1989). Ulcerative colitis (UC) is a chronic relapsing and remitting inflammatory disorder of the gastrointestinal tract that affects the large bowel. Unlike Crohn's Disease (CD), where inflammatory process is transmural and may affect any part of alimentary tract, uncomplicated UC is confined to the mucosa and restricted to the large bowel (Weinstein *et al.,* 2005). Disease extent can be broadly dividedinto distal and more extensive disease:"Distal" disease refersto colitis confined to therectum (proctitis) or rectum andsigmoid colon (proctosigmoiditis). More extensive disease includesleft sided colitis (up to the splenic flexure), extensive colitis (up to the hepatic flexure), pancolitis (affecting the whole colon)or backwash ileitis.(Carter *et al.,* 2004). The incidence of UC is approximately 10-20 per 100 000per year with a reported prevalence of 100-200 per 100000.

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The incidence remains stable, but the prevalence is likelyto be an underestimate, because this implies average diseaseduration (prevalence/incidence) of 10 years for a conditionthat is known to last for life. (Loftus 2004, Hawkey *et al.,* 2012). The etiology of UC is presently unknown but is likely multifactorial. The currently held paradigm involves the complex interaction of three elements: genetic susceptibility, host immunity, and environmental factors, (Laharie*et al* 2001). Currently, there is no single test that allows the diagnosis of UC with acceptable sensitivity and specificity. Thus, the diagnosis relies on a combination of compatible clinical features, laboratory findings and endoscopic appearances. Patients with UC may present with a variety of symptoms. Common symptoms include diarrhea, rectal bleeding, passage of mucus, tenesmus, urgency, and abdominal pain. In more severe cases, fever and weight loss may be prominent. The symptom complex tends to differ according to the extent of disease (DiMarino 2010).

In patients presenting with their first attack of UC, sigmoidoscopy with biopsies usually is sufficient to confirm the diagnosis, thereby allowing initiation of therapy. In patients with active flares, sigmoidoscopy is best performed in the unprepared bowel so the earliest signs of UC can be detected without the hyperemia that is frequently present because of preparative enemas (Tedesco *et al.,* 1983). After active disease has been controlled in a patient with newly diagnosed UC, colonoscopy should be performed to establish the extent of the

disease and to exclude CD. Additionally, intubation and biopsy of the terminal ileum should be attempted to exclude the presence of CD (Tedesco *et al.,* 1983). The earliest endoscopic findings in ulcerative colitis include erythema, edema, and an abnormal vascular pattern of the mucosa (mild ulcerative colitis). This may be followed by the development of coarse granularity ("wet sand-paper appearance"), superficial erosions and ulcers, and mucosal bleeding with scope contact or minimal trauma (moderate ulcerative colitis) (Langholz *et al.,* 1994). To monitor disease activity in patients with ulcerative colitis is easier than in patients with Crohn's disease this is because, the severity of symptoms and activity of inflammation tend to run parallel in ulcerative colitis when involvement of the large bowel is more extensive. The easy accessibility of the colonic mucosa by endoscopic and histological examination provides further information concerning the degree of inflammation.

Clinical and laboratory parameters are helpful in monitoring disease activity and to predict the outcome.High CRP levels are indicative of active disease or a bacterial complication. CRP levels can be used to guide therapy and follow up. Faecal markers can be divided into faecal excretion of leucocytes, serum proteins or leukocyte products. Among these markers is calprotectin which was first isolated from granulocytes in 1980; it is a sensitive marker of bowel inflammation (related to the extent of ulcerated intestinal surface and to the degree of inflammation) and correlate with relapse of quiescent disease (Tibble and Bjarnason 2001).

Clinical indices include Truelove and Witts Classification of Ulcerative Colitis, Mayo Score (Mayo Clinic Score and the Disease Activity Index), Powell-Tuck Index (St. Mark's Index) and Ulcerative Colitis Clinical Score (UCCS) (D'Haens *et al.,* 2007) Endoscopic activity scores for UC include Baron Score, Powell-Tuck Sigmoidoscopic Assessment, Endoscopic Index (Rachmilewitz Endoscopic Index), Mayo Score Flexible Proctosigmoidoscopy and Endoscopic index of severity (UCEIS) (Travis *et al.,* 2013). The UCEIS was developed in 2 phases: the first is the level of disagreement among investigators and 10 descriptors, each with 3 to 5 levels of severity, and the second is inter-observer and intra-observer variability for each descriptor. A model was then constructed that best represented overall endoscopic severity evaluated on a visual analogue scale (VAS), incorporating 3 descriptors, each with specific definitions: vascular pattern (3 levels), bleeding (4 levels), and erosions and ulcers (4 levels) (Table 1).

Aim of the work: The aim of this work was to evaluate the validity of Ulcerative Colitis Endoscopic Index of Severity (UCEIS) in the evaluation of Ulcerative Colitis. The worst disease area was scored, and the final score represented the sum of the components, with the UCEIS ranging from 3 (normal) to 11 (most severe).

MATERIALS AND METHODS

The present study included eighty patients with Ulcerative Colitis during different phases of activity. All patients were subjected to the following after obtainingan informed consent:

- **History taking:** stressing on age of onset of the disease, gastrointestinal manifestations of IBD, extra-intestinal manifestations of IBD, and duration of illness.
- **Examination:** Complete clinical examination with special emphasis on signs of malnutrition & dehydration, extra intestinal manifestations of IBD, abdominal examination and per-rectal and perianal examination.

Laboratory investigations including: Complete blood picture, blood urea, serum creatinine, serum albumin, quantitative CRP, alanine aminotransferase, aspartate aminotransferase, erythrocyte sedimentation rate (ESR), stool analysis and faecal calprotectin (Nikolausand Schreiber 2007, Solem *et al.,* 2005, Osada *et al.,* 2010).

Colonoscopy and mucosal biopsies: Colonoscopy was done till terminal ileum, Mucosal biopsies were taken from different parts of the colon, and disease activity was assessed according to Ulcerative Colitis Endoscopic Index of Severity (UCEIS) (Travis *et al.,* 2013). Histopathological confirmation of the diagnosis was done as well as grading the severity of the disease. Biopsies were fixed in paraffin and stained by H&E and examined under high magnification (Solem *et al.,* 2005, Eaden *et al* 2000, Riley *et al.,* 1991).

RESULTS

Acute phase reactants

- ESR, ranged between 10.0 –78.0(ml/h) with the mean of 29.59 ± 13.98 (ml/h). The median was 25.
- CRP, ranged between 4.10 –54.0 (mg/l) with the mean of 15.79 ± 9.48 (mg/l). The median was 15.

Faecal calprotectin: Ranged between 18.0 –2811.0 (μ/gm) with the mean of 544.22 ± 639.65 (μ/gm).

Table 1. Ulcerativecolitisendoscopicindexofseverity (UCEIS©) (Travis *et al*., 2013)

Descriptor(Score mostsevere lesions)	LikerScaleanchor points	Definition
Vascularpattern	Normal(1)	Normalvascularpatternwitharborisationofcapillaries clearlydefined,orwithblurringorpatchylossof capillarymargins
	Patchy obliteration (2)	Patchyobliterationofvascularpattern
	Obliterated(3)	Completeobliterationofvascularpattern
Bleeding	None(1)	No visible blood
	Mucosal(2)	Somespotsorstreaksofcoagulatedbloodonthesurface ofthemucosaaheadofthescope,whichcanbewashed away
	Luminalmild(3)	Somefreeliquidbloodinthelumen
	Luminalmoderateor severe(4)	Frankbloodinthelumenaheadofendoscopeorvisible oozingfrommucosaafterwashingintra-luminalblood,or visibleoozingfromahaemorrhagicmucosa
Erosions&Ulcers	None(1)	Normalmucosa,novisibleerosionsorulcers
	Erosions(2)	Tiny(<5mm)defectsinthemucosa,ofawhiteoryellow colourwithaflatedge
	Superficialulcer(3)	Larger(>5mm)defectsinthemucosa,which are discrete fibrin-coveredulcerswhencomparedtoerosions,but remain superficial
	Deepulcer(4)	Deeperexcavateddefectsinthemucosa,withaslightly raisededge

Only 2.5% of patients showed normal ranges of faecal calprotectin and 97.5% of patients showed abnormal levels. The median was 344.

Endoscopic findings: Obliterated vascular pattern was present in 63.8%, patchy obliteration of vascular pattern was present in 30% and normal vascular pattern was present in 6.3%.

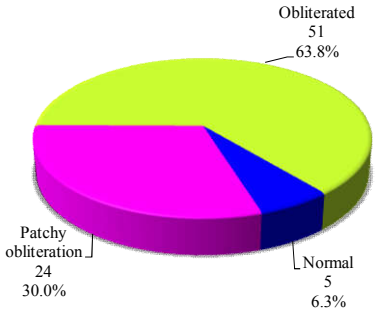

Figure 1. Distribution of the studied cases according to vascular pattern at endoscopy

The bleeding was classified into none, mucosal, luminal mild and luminal moderate or severe. Mucosal bleeding is defined as some spots or streaks of coagulated blood on the surface of the mucosa ahead of the scope, which can be washed away. Luminal mild bleeding is defined as some free liquid blood in the lumen. Luminal moderate or severe bleeding is defined as frank blood in the lumen ahead of endoscope or visible oozing from mucosa after washing intra-luminal blood, or visible oozing from a haemorrhagic mucosa. 36.3% of examined cases showed luminal mild bleeding, 35% showed mucosal bleeding, 18.8% showed no bleeding and 10% showed luminal moderate or severe bleeding.

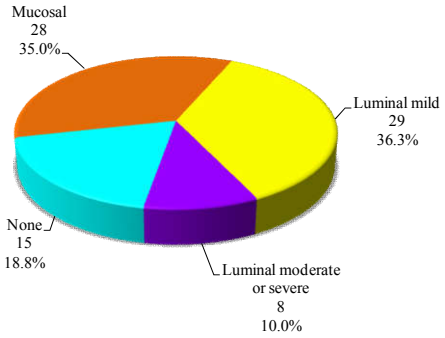

Figure 2. Distribution of the studied cases according to bleeding at endoscopy

Erosions and ulcers: 62.5% showed erosions, 23.8 showed superficial ulcers, 10% showed deep ulcers and 3.8% of studied patients showed no erosions or ulcers.

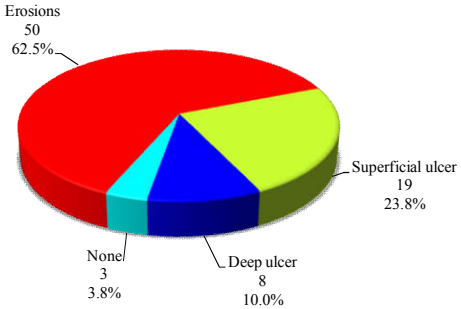

Figure 3. Distribution of the studied cases according to erosions & ulcers at endoscopy

Histopathological examination of colonic mucosa

27.5% of studied patients showed mild activity, 37.5% showed moderate activity, and 35% showed severe activity.

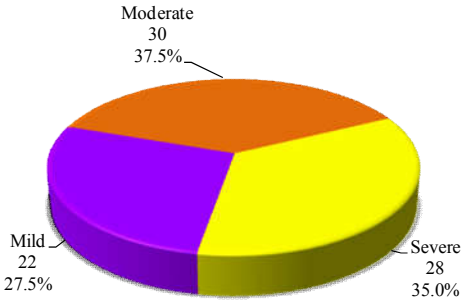

Figure 4. Distribution of studied cases according tohistopathological examination of colonic mucosa

Assessment of disease activity

Distribution of studied sample according to final score of Ulcerative Colitis Endoscopic Index of Severity (UCEIS):

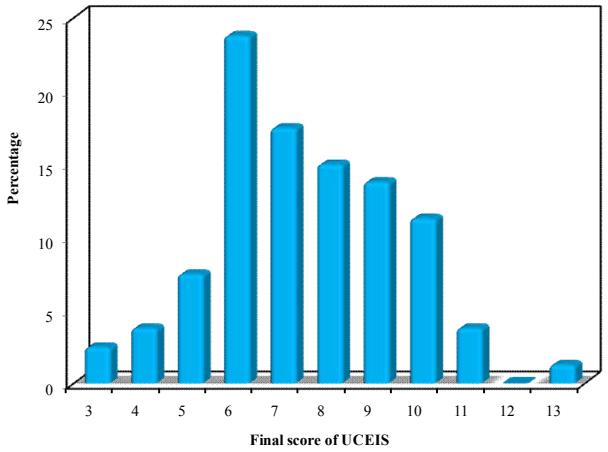

Figure 5. Distribution of studied cases according to final score of Ulcerative Colitis Endoscopic Index of Severity (UCEIS)

Distribution of studied cases according to total Mayo's score (Disease Activity Index)

According to Mayo's severity score 51.25% had severity score from 6 to 10, 30% had score > 10and 18.75% of cases had severity score < 5.

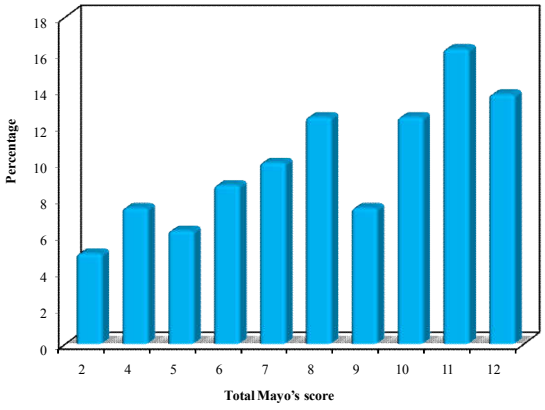

Figure 6. Distribution of studied cases according to total Mayo's score

Table 2. Assessment of disease activity using Truelove and Witts index

	No. of patients	%
Disease activity		
Mild	25	31.25
Moderate	20	25
Severe	35	43.75

The disease activity using Truelove and Witts, 43.75% had severe Truelove activity, 31.25% of patients had mild Truelove activity and 25% had moderate Truelove activity.

Correlation between UCEIS and different parameters

Table 3. Correlation between UCEIS final score and acute phase reactants

`	UCEIS final score	
	r_s	P
ESR	0.104	0.360
CRP	0.107	0.346

r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

The correlation between the UCEIS final score and ESR, CRP using the spearman coefficient was 0.104 and 0.107 respectively.

Table 4. Correlation between UCEIS final score and faecal calprotectin

	N	UCEIS final score			Z	P
		Min. – Max.	Mean ± SD	Median		
Faecal alprotectin						
Normal	2	3.0 – 6.0	4.50 ± 2.12	4.50	1.827	0.068
Abnormal	78	3.0 – 13.0	7.46 ± 1.93	7.0		
r_s(p)			0.441* (<0.001*)			

Z: Z for Mann Whitney test
r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

The relation between UCEIS final score with faecal calprotectin in which normal range of faecal calprotectin showed mean final score 4.50 ± 2.12 and abnormal range of faecal calprotectin showed mean final score 7.46 ± 1.93. There was a statistical significance between faecal calprotectin and UCEIS final score ($p<0.001$).

Table 5. Correlation between UCEIS final score and Truelove and Witts activity

	N	UCEIS final score			$^{KW}\chi^2$	P
		Min. – Max.	Mean ± SD	Median		
Truelove and Witts activity						
Mild	25	3.0 - 11.0	7.64 ± 1.87	8.0	1.235	0.539
Moderate	20	4.0 - 11.0	7.05 ± 1.99	7.0		
Severe	35	3.0 - 13.0	7.40 ± 2.09	7.0		
r_s(p)			-0.064 (0.576)			

$^{KW}\chi^2$: Chi square for Kruskal Wallis test
r_s: Spearman coefficient

35 patients with severe Truelove activity showed mean UCEIS score 7.40 ± 2.09. 25 patients with mild Truelove activity showed mean UCEIS score 7.64 ± 1.87. And 20 patients with moderate Truelove activity showed mean UCEIS score 7.05 ± 1.99. There is no statistical significance between Truelove and Witts activity and UCEIS final score.

Table 6. Correlation between UCEIS final score and Mayo score

	UCEIS final score	
	r_s	P
Mayo score	0.032	0.778

r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

The correlation between the UCEIS final score and mayo score (in which the spearman coefficient was 0.032) showed non-statistical significance.

Table 7. Correlation between UCEIS final score and histopathological examination of colonic mucosa

	N	UCEIS final score			$^{KW}\chi^2$	P
		Min. – Max.	Mean ± SD	Median		
Biopsy						
Mild	22	3.0 – 7.0	5.45 ± 1.10	6.0	44.222*	<0.001*
Moderate	30	4.0 – 11.0	7.27 ± 1.57	7.0		
Severe	28	6.0 – 13.0	9.04 ± 1.43	9.0		
r_s(p)			0.747* (<0.001*)			

$^{KW}\chi^2$: Chi square for Kruskal Wallis test
r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

30 patients with moderate activity showed mean range of 7.27 ± 1.57. 28 patients had severe activity with mean range of 9.04 ± 1.43. And 22 patients had mild activity with mean range of 5.45 ± 1.10. There was a statistical significance between histopathological activity and UCEIS final score ($p<0.001$).

Correlation between Mayo score and different parameters

Table 8. Correlation between Mayo final score and acute phase reactants

	Mayo score	
	r_s	P
ESR	0.251*	0.024
CRP	-0.177	0.115

r_s: Spearman coefficient
*: Statistically significant at $p \leq 0.05$

The correlation between the Mayo final score and ESR, CRP using the spearman coefficient was 0.251 and -0.177 respectively.

Table 9. Correlation between Mayo final score and faecal calprotectin

	N	Mayo Score			Z	P
		Min. – Max.	Mean ± SD	Median		
Faecal calprotectin						
Normal	2	8.0 - 10.0	9.0 ± 1.41	9.0	0.186	0.852
Abnormal	78	2.0 – 12.0	8.28 ± 2.90	8.50		
r_s(p)			0.087(0.441)			

Z: Z for Mann Whitney test
r_s: Spearman coefficient

The relation between Mayo final score with faecal calprotectin in which normal range of faecal calprotectin showed mean final score 9.0 ± 1.41 and abnormal range of faecal calprotectin showed mean final score 8.28 ± 2.90. There was no statistical significance between faecal calprotectin and Mayo final score ($p=0.441$).

Table 10. Correlation between Mayo final score and Truelove and Witts activity

	N	Mayo Score			$^{KW}\chi^2$	P
		Min. – Max.	Mean ± SD	Median		
Truelove activity						
Mild	25	2.0 – 12.0	8.32 ± 3.04	8.0	2.832	**0.243**
Moderate	20	2.0 – 12.0	9.10 ± 2.71	10.0		
Severe	35	2.0 – 12.0	7.83 ± 2.82	8.0		
r_s(p)		-0.111(0.326)				

$^{KW}\chi^2$: Chi square for Kruskal Wallis test
r_s: Spearman coefficient

35 patients with severe Truelove activity showed mean Mayo score 7.83 ± 2.82. 25 patients with mild Truelove activity showed mean Mayo score 8.32 ± 3.04. And 20 patients with moderate Truelove activity showed mean Mayo score 9.10 ± 2.71. And. There was no statistical significance between Truelove and Witts activity and Mayo final score.

Table 11. Correlation between Mayo final score and histopathological activity

	N	Mayo Score			$^{\Omega}\chi^2$	p
		Min. – Max.	Mean ± SD	Median		
Histopathological activity						
Mild	22	2.0 – 12.0	8.23 ± 2.99	8.0	2.778	0.249
Moderate	30	2.0 – 12.0	7.67 ± 3.09	7.0		
Severe	28	4.0 – 12.0	9.04 ± 2.44	10.0		
r_s(p)		0.115 (0.308)				

$^{KW}\chi^2$: Chi square for Kruskal Wallis test
r_s: Spearman coefficient

30 patients with moderate activity showed mean range of 7.67 ± 3.09. 28 patients had severe activity with mean range of 9.04 ± 2.44. And 22 patients had mild activity with mean range of 8.23 ± 2.99. There was no statistical significance between histopathological activity and Mayo final score (p=0.308).

DISCUSSION

In the present study, the mean erythrocyte Sedimentation rate (ESR) level for UC patients was 29.59 ± 13.98 (ml/h) which was of no significance. A study of Desai *et al.* (Desai et al., 2001) reported that ESR is an indirect measurement of plasma acute phase protein concentration and is influenced by the morphology of erythrocytes as well as some plasma constituents as immunoglobulins.In addition, Shine et al (Shine *et al* 1988), reported that ESR proved to be the second best worker after CRP for the detection of IBD course or activity.
In the present study, the mean CRP for UC patients were 15.79 ± 9.48 (mg/l) with statistical significance increase than normal levels.

Langhorst *et al* (Langhorst *et al* 2008) conducted a similar study and reported that there were different serum CRP levels according to the inflammatory status which was observed for UC patients. CRP has a short half-life (19 hours) compared with other acute phase proteins and therefore rises early after the onset of inflammation and rapidly decreases after resolution of the inflammation. The function of CRP in vivo is still incompletely understood. CRP binds to phosphocholine containing microorganisms or particles which in turn lead to C1q and classical complement activation. CRP also plays a role in the opsonisation of infectious agents and damaged cells. (Pepys 1981, Ballou and Kushner 1992, Young *et al.,* 1991, Mold *et al.,* 2002). UC has only a modest to absent CRP response. (Pepys *et al* 1977, Saverymuttu *et al* 1986)This is an important feature to keep in mind when using CRP in clinical practice. There is no good explanation for this heterogeneity given that in UC increased amounts of IL-6, IL-1b, or TNF-α are also detected.

Regarding the mean faecal calprotectin levels for UC patients in the present study they were 544.22 ± 639.65 (μ/gm).97.5% of patients had abnormal faecal calprotectin levels and 2.5% had normal faecal calprotectin levels. Schoepfer *et al.,* (Schoepfer *et al.,* 2008). Found that calprotectin levels can be used in discriminating IBS from organic diseases of the colon, especially inflammatory bowel disease. They also reported that calprotectin levels were significantly higher in the group with moderate to severe disease activity. The presence of calprotectin in faeces can therefore be seen as directly proportional to neutrophil migration to the gastrointestinal tract. Although calprotectin is a very sensitive marker for detection of inflammation in the gastrointestinal tract, it is not a specific marker and increased levels are also found in neoplasia, IBD, infections, and polyps. Faecal calprotectin is a very stable marker (stable for more than one week at room temperature) and is resistant to degradation, which makes it attractive. (Tibble *et al.,* 2000).

In the present study, the endoscopic severity was assessed according to Ulcerative Colitis Endoscopic Index Of Severity (UCEIS) and results were obtained as follows vascular pattern showed different patterns where normal vascular pattern represented 6.3%, patchy obliteration represented 30% and obliteratedvascular patternrepresented 63.8%.Inaddition, bleeding was classified into none, mucosal, luminal mild and luminal moderate or severe.18.8% showed no bleeding,35% showed mucosal bleeding, 36.3% showed luminal mild bleeding and 10% showed luminal moderate or severe bleeding. Erosions and ulcers were divided into none, erosions, superficial ulcer and deep ulcer.3.8% showed no erosions or ulcers, 62.5% showed erosions, 23.8 showed superficial ulcers and 10% showed deep ulcers. There was a high level of correlation between UCEIS scores and overall assessment of severity.

This study determined that just three descriptors (vascular pattern, bleeding, erosions and ulcers) were sufficient to create a model accounting for the full range of endoscopic severity associated with UC. This was in agreement with Simon *et al* (2011) (Simon *et al.,* 2012) who stated that the UCEIS accurately predicts overall endoscopic severity judged by a visual analogue scale (VAS) and is a reliable instrument for measuring the endoscopic disease activity of UC. After initial assessment for validity, it also appears to be valid, but additional validity testing is needed. Just 3 descriptors (each with 3 or 4 levels of severity) accounted for 86% of the variance in the overall assessment of endoscopic severity. Given the enormous variance in assessment between specialists in the initial evaluation this represents substantial progress. (Simon *et al.,* 2012).

It is conceivable that physician knowledge of clinical information might influence endoscopic assessment.For the UCEIS, knowledge of symptoms had a modest effect overall, although, as might be expected, this had the greater effect on the bleeding descriptor. (Bushnell *et al.,* 2002). The IBD

disease activity in the present study wasassessed clinically using Truelove and Witt's Classification and Mayo DAI severity score andUlcerative Colitis Endoscopic Index of Severity (UCEIS). The patients were categorized as mild, moderate or severe. Using Truelove and Witt's classification for UC patients in the present study, 31% of patients had mild disease, 25% had moderate disease and 44% had severely active disease. Using Mayo DAI severity score for UC patients in the present study, 18.75% of cases had severity score < 5, 51.25% had severity score from 6 to 10 and 30% had score >10. In the present study, Truelove and Witt's classification was not correlated significantly with Ulcerative Colitis Endoscopic Index of Severity (UCEIS). The present study demonstrated that faecal calprotectin levels correlated closely with UCEIS final score.

Using spearman coefficient, there was a statistically significant linear correlation between faecal calprotectin and UCEIS final score. Xiang *et al* (Xiang *et al.,* 2008), conducted a study and found faecal calprotectin concentrations were significantly higher in patients with active UC than in the patients with inactive UC. This study is a step in the validation of the UCEIS. It confirmed the reliability of the UCEIS, even if further validation is needed to establish thresholds for remission, the clinical relevance of different UCEIS scores, and responsiveness of the UCEIS to change in disease status. The UCEIS is based on evaluation of the most severely affected area at flexible sigmoidoscopy. It is as yet unclear how an overall score might be affected by full colonoscopy or whether it might be applied in colonic segments. (Thia *et al.,* 2011, Samuel *et al.,* 2013). Colonoscopy could result in a higher UCEIS than sigmoidoscopy simply because a larger area is examined; because scoring is applied to the area of maximum severity. This might, in turn, alter the overall evaluation of endoscopic severity.

The UCEIS showed consistency in endoscopic evaluation and, if it can be shown to correspond with histological disease activity or validated biomarkers may facilitate the use of smaller sample sizes in clinical trials due to increased statistical power derived from this consistency. If the UCEIS can demonstrably affect decision making or predict clinical outcome, then this will amplify its role in clinical practice. In the present study, UCEIS final score correlated significantly with histopathological examination of colonic mucosa ($p<0.001$). In this study, there was no statistical significance between the faecal calprotectin levels and Mayo final score. This was in contrast to the Ho *et al* (Ho *et al.,* 2009) who found that faecal calprotectin levels correlated closely with Mayo DAI severity score in UC group. The Mayo score and histopathologic activity didn't correlate significantly in this study. Other studies showed that there was significant correlation between Mayo severity score and histopathologic activity. The UCEIS reliably evaluates the overall endoscopic severity of UC and accounts for 88% of the variance between endoscopists. It is simple to use, based on the sum of 3 descriptors with a score ranging from 3 to 13. The thresholds for severity and remission remain to be defined, as does the responsiveness to change.

Conclusions

UCEIS is an easy index to be used in the evaluation of disease activity of ulcerative colitis. UCEIS clearly defines different levels for each of three descriptors, to exclude variability and to apply precise definitions. UCEIS significantly correlates with clinical, laboratory and histopathological markers of activity of Ulcerative colitis.

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