Psychiatria Danubina, 2016; Vol. 28, Suppl. 2, pp S242–S246
Medicina Academica Mostariensia, 2016; Vol. 4, No. 1-2, pp 58-62 *Original paper*

CORRELATION OF CLINICAL AND ENDOSCOPIC INDICES IN IBD PATIENTS IN UNIVERSITY CLINICAL HOSPITAL MOSTAR

Emil Babić, Milenko Bevanda, Maja Karin, Mile Volarić, Danijel Bevanda, Daniela Bevanda Glibo & Ante Bogut

Department of Gastroenterology and Hepatolog, University Hospital Center Mostar, Mostar, Bosnia and Herzegovina

received: 18.7.2016; revised: 23.9.2016; accepted: 8.11.2016

SUMMARY

Background: *To explore correlation between clinical and endoscopic indices in inflammatory bowel disease (IBD) patients.*

Subjects and methods: *There were 112 patients with inflammatory bowel disease. All patients with diagnosed IBD was established a degree of clinical and endoscopic disease activity. CDAI (Crohn's disease activity index) was used as clinical and SES-CD (Simplified Endoscopic Crohn Disease Index) as endoscopic index for Crohn's disease. For ulcerative colitis Truelov & Witts index was used as clinical and Baron as endoscopic activity index. Correlation of clinical and endoscopic indices were compared in Crohn disease (CD) and ulcerative colitis (UC). Patients were analyzed by clinical entities - CD and UC, according to sex, age, parameters of anemia, duration of disease and education.*

Results: *In the total of 112 IBD patients there were 69 patients diagnosed as ulcerative colitis (61.6%) and 43 as Crohn's disease (38.4%). There were 58 (51.8%) women and 54 (48.2%) men. Comparison between endoscopic and clinical indices in CD and UC demonstrated no significant differences in ilnness activity. Endoscopic and clinical disease activity was associated with a higher inflammatory parameters (CRP and leucocytes, L) and lower parameters of hemoglobin (Hb) and MCV.*

Conclusion: *Our research has established a good correlation between clinical and endoscopic index of disease activity in the CB and UC in inflammation. Clinical indices can be used for monitoring inflammation.*

Key words: *inflammatory bowel disease - endoscopic and clinical indices - CDAI (Crohn's disease activity index) - SES-CD (Simplified Endoscopic Crohn Disease Index) – Truelov & Witts - Baron index*

* * * * *

INTRODUCTION

Inflammatory bowel diseases are idiopathic, chronic inflammatory diseases of the digestive system. IBD is manifested as a chronic inflammation of the lining of the digestive tract, but also through extraintestinal manifestations in other organs, the skin, joints, liver, eyes and other (Arvikar & Fisher 2011, Yüksel et al. 2009, Tsiolakidou & Koutroubakis 2008, Navaneethan & Shen 2010) There are four entities: 1) Crohn's disease (CD), 2), ulcerative colitis (UC), 3) indeterminate colitis and 4) microscopic colitis (Malatjalian 1987).

Clinical assessment of disease severity is very important in everyday clinical practice. There are a number of tests for the clinical end endoscopic assessment of CD and UC. For the assessment of disease activity we used both, clinically and endoscopic activity index but there is no definitive consensus in the literature about preferring disease activity index (Katicić 2013).

Our task was to establish correlation between clinical and endoscopic indices in IBD patients.

SUBJECTS AND METHODS

There were 112 patients with inflammatory bowel disease, 43 suffer from Crohn's disease and 69 from ulcerative colitis. According to sex, there were 58 women and 54 men. These patients were hospitalized in our department or treated in outpatient Clinic for inflammatory bowel disease. IBD was diagnosed with standard procedure (clinical, laboratory markers of inflammation, serological findings on perinuclear anti-neutrophil cytoplasmic of antibodies - pANCA antibodies to Saccharomyces cerevisiae - ASCA, endoscopy with biopsy for histopathological analysis, possibly radiological methods - passage of the small intestine, CT and MR) (Zubcevic et al. 2010, Nisihara et al. 2010, Russell et al. 2009). Degree of clinical and endoscopic disease activity was established to all IBD patients, CDAI as clinical and SES-CD as endoscopic for Crohn's disease and Truel & Witts as clinical and Baron as endoscopic activity index for ulcerative colitis. Patients in the study were analyzed by clinical entities - CB and UC-in, according to sex, age, duration of disease and education.

Laboratory findings

On all respondents have taken blood samples from the cubital vein and analyzed in the Clinical Laboratory of the University Clinical Hospital Mostar: hemoglobin (Hb), erythrocyte (E), hematocrit (Htc), sedimentation (SE), leukocytes (L), C-reactive protein (CRP).

Endoscopic examination

Colonoscopy were done to all patients with IBD. In case of the disease in the upper parts of the digestive system, esophagogastroduodenoscopy id done to evaluate a stage of the disease. Gastric and duodenal ulcers were diagnosed after upper endoscopy.

Endoscopic examinations were realized by trained physicians in the Cabinet for endoscopy Department of Gastroenterology Clinic of Internal Medicine SKB Mostar, according to the standard method of execution (colonoscopy and esophagogastroduodenoscopy assisted by trained nurses).

Clinical examination

All the patients had taken history of illness and made a clinical examination to determine the general condition, fever, heart rate, number of chairs, blood and mucus in the stool, treatment of disease, extra-intestinal manifestations, palpable abdominal mass, weight. Those laboratory parameters are needed to determine clinical disease activity index. All patients with CD and UC infection were determined the value of clinical and endoscopic indices - CDAI and SES-CD in CD and Truelov & Witts and Baron index in UC (Graham et al. 2006, Voegtlin et al. 2010). Clinical CDAI for Crohn's disease takes into account the number of liquid / soft stools per day, abdominal pain that occur during the week, extraintestinal presence of symptoms, the need for treatment with opioids, presence of palpable abdominal mass and hematocrit and body weight patient. The result of <150 indicate remission of the disease, 150-220 on a mild form of the disease, 220-450 medium severe disease and >450 to a severe form of the disease (Best 2006).

SES-CD index is used as endoscopic index for Crohn's disease. The digestive tract is analyzed in five segments: the rectum, descedens, transverzum, ascedens and ileum where we analyze the presence of ulcers, ulcerated and the affected area of the mucous membranes and the presence of stricture. Value of 0-3 represents the result of disease remission, mild 4-10, 11-19 high, above 20 points is severe form of the disease (Daperno et al. 2002).

For assessment of clinical activity of ulcerative colitis was used index by Truelove & Witts (Hirai et al. 2010).

Baron was used to determine endoscopic activity in UC (Travis et al. 2011).

RESULTS

In the total of 112 IBD patients there were 69 patients diagnosed as ulcerative colitis (61.6%) and 43 as Crohn's disease (38.4%). There were 58 (51.8%) women and 54 (48.2%) men.

The comparison between endoscopic and clinical indexes in CD and UC demonstrated no significant differences in ilnness activity (Table 1, Table 2).

Table 1. Indices in Crohn's disease

	SES-CD	
	r	p
CDAI	0.694	<0.001

CDAI=Crohn's disease activity index;
SES-CD=Endoscopic Crohn Disease Index

Table 2. Indices in ulcerative colitis

	Baron	
	r	p
Truel & Witts	0.688	<0.001

Table 3. Indices activities to inflammatory parameters and anemia

	Baron		Truel & Witts		SES-CD		CDAI	
	r	p	r	p	r	p	r	p
L	0.643	<0.001	0.570	<0.001	0.270	0.079	0.197	0.205
E	-0.473	<0.001	-0.423	<0.001	-0.518	<0.001	-0.624	<0.001
Hb	-0.595	<0.001	-0.560	<0.001	-0.528	<0.001	-0.589	<0.001
MCV	-0.453	<0.001	-0.485	<0.001	-0.386	0.012	-0.616	<0.001
CRP	0.572	<0.001	0.435	<0.001	0.674	<0,001	0.747	<0.001

L – Leukocytes; E – Erythrocyte; Hb – Hemoglobin; MCV - Mean corpuscular volume; CRP - C-reactive protein; p<0.001

Table 4. Gender with inflammatory parameters and anemia

	Gender					
	M		W		t	p
	$\bar{x}$	SD	$\bar{x}$	SD		
L	86.56	43.71	89.95	102.15	-0.226	0.822
E	43.72	6.22	41.14	4.50	2.504	0.014
Hb	125.85	25.07	116.81	18.27	2.192	0.030
MCV	834.41	56.10	812.09	63.84	1.952	0.053
CRP	159.20	266.57	183.05	361.71	-0.395	0.694

L – Leukocytes; E – Erythrocyte; Hb – Hemoglobin; MCV - Mean corpuscular volume; CRP - C-reactive protein

Endoscopic and clinical disease activity was associated with a inflammatory parameters (CRP and leucocytes, L). IBD patients with higher level of illness activity had lower parameters of hemoglobin (Hb) and MCV (Table 3).

Parameters of anemia were found more expressed in the women than men in IBD patients (Table 4).

DISCUSSION

The correlation between clinical and endoscopic index is not finally defined. There are studies that show good correlation, but there are also studies that have different results. Our research has confirmed a good correlation between clinical and endoscopic indices of disease activity in CD and UC (Rutgeerts 2006, Sipponen et al. 2010). Some other studies have not shown a good correlation between clinical and endoscopic activity index. The fact is that normal clinical disease activity index does not need to validate and endoscopic remission of the disease (Falvey et al. 2015). Cliera at al also found a weak correlation between clinical and endoscopic index of activity in Crohn's disease, especially in the active stage of the disease (Cellier et al. 1994). Hosseini and Daperna confirmed our results in which there is established a strong correlation between endoscopic and clinical index of disease activity in ulcerative colitis (Hosseini et al. 2015, Daperno et al. 2004).

Considering the different research results and the degree of correlation in IBD, may not be sufficient to compare the clinical and endoscopic indices of disease activity. Clinical practice has shown necessity of new parameters for monitoring disease activity because there is evidence of the inadequacy of disease surveillance only with the indices (Algaba et al. 2013). It is necessary to look for new instruments for monitoring, but not only clinical and endoscopic indices (Allocca et al. 2013).

There is a question of colorectal cancer (CRC) in patients with IBD. Patients with IBD belong to the group with the highest risk of CRC. Although endoscopy and clinical indices may well correlate with regard to inflammation, without endoscopic evaluation would not be possible to confirm the diagnosis CRC in these patients (Rubin et al. 2013). There is no definitive consensus in the literature which disease activity index is best and we need more data from new research (Katicić 2013). Monitoring the patient's clinical condition is good indicator of disease activity even as the gold standard remains a regular endoscopic follow-up of inflammatory changes and complications (Zahn et al. 2006).

There was a positive correlation between clinical and endoscopic index of disease activity in inflammatory parameters in our patients. CRP was significantly higher in clinical and endoscopic active ulcerative colitis and Crohn's disease, and leukocyte counts were increased in CD and significantly higher in UC. Positive correlation between clinical and endoscopic disease activity with most inflammatory parameters was significantly increased. There was a negative correlation of clinical and endoscopic indices of disease activity according to the parameters of anemia. In patients who had a severe form of inflammatory bowel disease, erythrocytes, hemoglobin and MCV are significantly reduced.

There are many causes of anemia in these patients. There is a loss of blood due to bleeding from the digestive tract, the manifest and the occult. Chronic inflammation leads to loss of iron anemia. Disturbed metabolism of iron with the adjustment of erythropoiesis and removing iron from the circulation to the warehouses in the reticuloendothelial system causes anemia (Weiss & Goodnough 2005, Gasche et al. 2011). Adequate therapeutic approach leads to improvements in the clinical picture and the effectiveness of other drugs for IBD and enhances the quality of life in IBD patients (Giannini & Martes 2006). The preferred route of iron administration is intravenous therapy (Kent et al. 2011). Parameters of anemia (E, Hb) were significantly lower in women than in men.

What is already known on this topic?

The correlation between clinical and endoscopic index is not finally defined. There are studies that show good correlation, but there are also studies that have different results.

What is the contribution of research?

Our research has confirmed a good correlation between clinical and endoscopic indices of disease activity in the CD and UC. Any research on this subject gives new results for meta-analysis.

CONCLUSION

Considering the different research results and the degree of correlation in IBD, may not be sufficient to use only clinical or endoscopic indices disease activity. Clinical practice has shown necessity of new parameters and aprouch for monitoring disease activity. For now it is the best to use both indices in order to monitor activity and complications of the disease (for example CRC).

Acknowledgements: None.

Conflict of interest : None to declare.

Contribution of individual authors:

Contributors Emil Babic and Milenko Bevanda were involved in the concept and design of the survey; Emil Babić, Maja Karin, Mile Volarić, Danijel Bevanda, Ante Bogut collected, assembled, analysed and interpreted the data; Daniela Bevanda Glibo critically reviewed and edited the manuscript. All authors have approved the finalversion of the article, including the authorship list. Emil Babić accepts responsibility for the integrity of the work as a whole from inception to the published article.

References

1. *Algaba A, Linares PM, Fernández-Contreras ME, Ordoñez A, Trápaga J, Guerra I: Relationship between levels of angiogenic and lymphangiogenic factors and the endoscopic, histological and clinical activity, and acute-phase reactants in patients with inflammatory bowel disease. J Crohns Colitis 2013; 7:569-79.*
2. *Allocca M, Fiorino G, Danese S: Cross-sectional imaging modalities in Crohn's disease. Dig Dis 2013; 31:199-201.*
3. *Arvikar SL &Fisher MC: Inflammatory bowel disease associated arthropathy. Curr Rev Musculoskelet Med 2011; 4:123-31.*
4. *Best WR: Predicting the Crohn's disease activity index from the Harvey-Bradshaw Index. Inflamm Bowel Dis 2006; 12:304-10.*
5. *Cellier C, Sahmoud T, Froguel E, Adenis A, Belaiche J, Bretagne JF et al.: Correlations between clinical activity, endoscopic severity, and biological parameters in colonic or ileocolonic Crohn's disease. A prospective multicentre study of 121 cases. The Groupe d'Etudes Thérapeutiques des Affections Inflammatoires Digestives Gut 1994; 35:231-5.*
6. *Daperno M, Van Assche G, Bulois P: Development of Crohn's disease endoscopic score CDES: a simple index to assess endoscopic severity of Crohn's disease. Gastroenterology 2002; 122: 216.*
7. *Daperno M, D'Haens G, Van Assche G, Baert F, Bulois P, Maunoury V: Development and validation of a new, simplified endoscopic activity score for Crohn's disease: the SES-CD. Gastrointest Endosc 2004; 60:505-12.*
8. *Falvey JD, Hoskin T, Meijer B, Ashcroft A, Walmsley R, Day AS: Disease activity assessment in IBD: clinical indices and biomarkers fail to predictendoscopic remission. Inflamm Bowel Dis 2015; 21:824-31.*
9. *Gasche C, Evstatiev R, Haas T, Kaser A, Knoflach P, Petritsch W: Diagnosis and treatment of iron deficiency and anaemia in inflammatory bowel diseases. Consensus of the Austrian IBD Working Party. Z Gastroenterol 2011; 49:627-32.*
10. *Graham DB, Jager DL, Borum ML: Metastatic Crohn's disease of the face. Dig Dis Sci 2006; 51:2062-3.*
11. *Giannini S & Martes C: Anemia in inflammatory bowel disease. Minerva Gastroenterol Dietol 2006; 52:275-91.*
12. *Hirai F, Matsui T, Aoyagi K, Inoue N, Hibi T, Oshitani N: Validity of activity indices in ulcerative colitis: comparison of clinical and endoscopic indices. Dig Endosc 2010; 22:39-44.*
13. *Hosseini SV, Jafari P, Taghavi SA, Safarpour AR, Rezaianzadeh A, Moini M: Fecal Calprotectin is an Accurate Tool and Correlated to Seo Index in Prediction of Relapse in Iranian Patients With Ulcerative Colitis. Iran Red Crescent Med J 2015; 17:e22796.*
14. *Katicić M: Activity indices in IBD. Acta Med Croatica 2013; 67:93-110.*
15. *Kent AJ, Blackwell VJ, Travis SP: What is the optimal treatment for anemia in inflammatory bowel disease? Curr Drug Deliv 2011; 9:356-66.*
16. *Malatjalian DA: Pathology of inflammatory bowel disease in colorectal mucosal biopsies. Dig Dis Sci 1987; 32:5S-15S.*
17. *Navaneethan U & Shen B: Hepatopancreatobiliary manifestations and complications associated with inflammatory bowel disease. Inflamm Bowel Dis 2010; 16:1598-619.*
18. *Nisihara RM, de Carvalho WB, Utiyama SR, Amarante H, Baptista ML: Diagnostic roleand clinical association of ASCA and ANCA in Brazilian patients with inflammatory bowel disease. Dig Dis Sci 2010; 55:2309-15.*
19. *Rubin DT, Huo D, Kinnucan JA, Sedrak MS, McCullom NE, Bunnag AP: Inflammation is an independent risk factor for colonic neoplasia in patients with ulcerative colitis: a case-control study. Clin Gastroenterol Hepatol 2013; 11:1601-8.*
20. *Russell RK, Ip B, Aldhous MC, MacDougall M, Drummond HE, Arnott ID: Anti-Saccharomyces cerevisiae antibodies status is associated with oral involvement and disease severity in Crohn disease. J Pediatr Gastroenterol Nutr 2009; 48:161-7.*
21. *Rutgeerts P: Scheduled maintenance treatment with infliximab is superior to episodic treatment for the healing of mucosal ulceration associated with Crohn's disease. Gastrointest. Endosc 2006; 63:433-42.*
22. *Sipponen T, Nuutinen H, Turunen U, Färkkilä M: Endoscopic evaluation of Crohn's disease activity: comparison of the CDEIS and the SES-CD. Inflamm Bowel Dis 2010; 16:2131-6.*
23. *Travis SP, Schnell D, Krzeski P, Abreu MT, Altman DG, Colombel JF: Developing an instrument to assess the endoscopic severity of ulcerative colitis: the Ulcerative Colitis Endoscopic Index of Severity (UCEIS). Gut 2011. doi:10.1136/gutjnl-2011-300486.*
24. *Tsiolakidou G & Koutroubakis IE: Thrombosis and inflammatory bowel disease-the role of genetic risk factors. World J Gastroenterol 2008; 14:4440-4.*
25. *Voegtlin M, Vavricka SR, Schoepfer AM, Straumann A, Voegtlin J, Rogler G: Prevalence of anaemia in inflammatory bowel disease in Switzerland: a cross-sectional study in patients from private practices and university hospitals. J Crohns Colitis 2010; 4:642-8.*
26. *Weiss G & Goodnough LT: Anemia of chronic disease. N Engl J Med 2005; 352-1011.*
27. *Yüksel I, Başar O, Ataseven H, Ertuğrul I, Arhan M, Ibiş M: Mucocutaneous manifestations in inflammatory bowel disease. Inflamm Bowel Dis 2009; 15:546-50.*
28. *Zahn A, Hinz U, Karner M, Ehehalt R, Stremmel W: Health-related quality of life correlates with clinical and endoscopic activity indexes but not with demographic features in patients with ulcerative colitis. Inflamm Bowel Dis 2006; 12:1058-67.*
29. *Zubcevic N, Mesihovic R, Zubcevic S: Usefulness of laboratory data in estimation of Crohn's disease activity. Med Arh 2010; 64:33-6.*

Appendix. Indices

Index 1. Clinical Activity Index for Crohn's disease (CDAI)

Parameter					Coefficient
Number of liquid / soft chair for 7 days					x 2
Abdominal pain for 7 days					x 6
0 = absent;	1 = mild;	2 = moderate;		3 = severe	
General condition for 7 days					x 6
0 = good;	1 = satisfactory;	2 = bad;	3 = very bad;	4 = extremely bad	
Extraintestinal symptoms					x 30
arthritis / arthralgia;	irutis/uveitis;	erythema nodosum, pyoderma gangrenosum, stomatitis;			
anal fissures, fistulae, abscesses;		fever during the previous week higher than 37.2°C;			
Opioid therapy as diarrhea	0 = no;	4 = yes			x 4
Palpable abdominal mass	0 = no;	2 = unlikely;	5 = certainly		x 10
Hematocrit	man 47,	women 42 (%)			x 6
Body weight (weight / standard weight) x 100 (kg)					x 1

Index 2. Endoscopic disease activity index (SES-CD)

	SES-CD			
Variables	0	1	2	3
Presence of ulceration	No	Aphthous ulcer (0.1-0.5 cm)	Large ulceration (0.5-2 cm)	Very large (>2 cm)
Ulcerated area	No	<10%	10-30%	>30%
Affected area	No	<50%	50-75%	>75%
Stricture	No	Single	Multiple	Obliteration

Index 3. Index by Truelove & Witts

Mild disease (60% of patients) with no systemic signs and with less than four stools daily, without significant bleeding and anemia, normal body temperature and pulse, SE <30

Moderate disease (25% patients) 4-6 diarrhea, fever and tachycardia, anemia, SE> 30, the extra symptoms (arthritis)

Severe illness (15% of patients) over 6 diarrhea, rectal bleeding as a dominant symptom, severe anemia, hypoalbuminemia

Index 4. Endoscopic stages of ulcerative colitis according to Baron

Endoscopic findings	Stage
Blood vessels visible, visualized normal mucosa	0
Erythema, granulation, vascular drawing partially visible	1
Ulcers, there is no visible blood vessels, contact and spontaneous bleeding	2
Wide ulceration, mucus, significant spontaneous bleeding, edematous mucosa	3

Correspondence:
Emil Babić, MD
University of Mostar Clinical Hospital,
Department of Gastroenterology and Hepatology
Bijeli Brijeg bb, 88000 Mostar, Bosnia and Herzegovina
E-mail: emil.babic@yahoo.com