Evaluation of Fecal and Serum Anti-*Saccharomyces cerevisiae* Antibodies (ASCA) as an Aid in the Diagnosis of Crohn's Disease

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Introduction

The utility of rapid diagnostic testing for the assessment of patients with inflammatory bowel disease (IBD) is increasingly used in the clinical setting. The measurement of serum ASCA is being used as an aid for the differentiation of Crohn's disease (CD) from ulcerative colitis (UC) and irritable bowel syndrome (IBS) and for predicting disease characteristics. Recently, a novel approach for measuring ASCA in feces has been validated as a diagnostic aid for assessing both adult and pediatric IBD. In this study, we compare the presence of fecal and serum ASCA in patients being evaluated with ileocolonoscopy for IBD and IBS.

Methods

Patient Population

Total Patients	129
CD UC IBS	47 41 41
Age Range	17 – 71 yr Mean = 42 yr
Gender ratio	Male : female CD 1:2.5 UC 1:1.3 IBS 1: 5.8

➢Fecal and serum specimens were collected from each patient prior to bowel preparation for ileocolonoscopy examination.

➢Quantitative measurement of fecal and serum immunoglobulin (Ig) was done by ELISA (*ASCA-CHEK* test; TechLab®, Inc., Blacksburg, VA). Fecal specimens were tested using a sample dilution of 1:10 and a 450 nm optical density (OD_{450}) cut-off ≥ 0.150. Serum specimens were tested using a 1:1000 dilution and an OD_{450} cut-off of ≥ 0.110.

➢Endoscopically obtained histopathology specimens in addition to macroscopic examination were used to assess severity of disease using the following score:

- 0 = "no acute inflammation"
- 1 = "mild acute inflammation"
- 2 = "moderate acute inflammation"
- 3 = "high acute inflammation"

Performance Characteristics for the ASCA-CHEK

Fecal ASCA N = 126	Crohn's Disease	Ulcerative Colitis / IBS
ASCA-positive	21	5
ASCA-negative	23	77

Serum ASCA N = 127	Crohn's Disease	Ulcerative Colitis / IBS
ASCA-positive	26	10
ASCA-negative	19	72

Fecal and/or serum ASCA N = 129	Crohn's Disease	Ulcerative Colitis / IBS
ASCA-positive	30	14
ASCA-negative	17	68

Non-Crohn's ASCA-positive N = 15	Ulcerative Colitis	Irritable bowel syndrome
Fecal ASCA-positive	1	4
Serum ASCA-positive	4	6

Statistical Analysis for ASCA vs Disease	Fecal ASCA % (95% C.I.) N = 126	Serum ASCA % (95% C.I.) N = 127	Fecal and/or Serum ASCA % (95% C.I.) N = 129
Sensitivity	48% (33 – 63)	58% (42 – 72)	64% (49 – 77)
Specificity	94% (86 – 98)	88% (78 – 94)	83% (73 – 90)
PPV Value	81% (60 – 93)	72% (55 – 85)	68% (52 – 81)
NPV Value	77% (67 – 85)	79% (69 – 87)	80% (70 – 88)
Correlation	78% (70 – 84)	77% (69 – 83)	76% (68 – 82)

Paired Serum / Fecal ASCA

Crohn's Disease Serum and Fecal ASCA-positive (%)	UC/IBS Serum and Fecal ASCA-positive (%)
15/20 (75%)	1/79 (0.01%)

Disease Characteristics for ASCA Results

Disease Location in Patients with CD

Crohn's Disease: Disease Location	ASCA Positive (%)	ASCA Negative (%)	ASCA Positive by Location (%)
Colon Only	8/20 (40%)	6/9 (67%)	8/14 (57%)
Ileum & Colon	6/20 (30%)	1/9 (11%)	6/7 (86%)
Ileum Only	5/20 (25%)	2/9 (22%)	5/7(72%)

Disease Severity in Patients with CD

Crohn's Disease: Severity	ASCA Positive (%)	ASCA Negative (%)
Scope Score 3	6/27 (22%)	3/15 (20%)
Scope Score 2	7/27 (26%)	3/15 (20%)
Scope Score 1	8/27 (30%)	6/15 (40%)
Scope Score 0	6/27 (22%)	3/15 (20%)

Time to Diagnosis for CD

Crohn's Disease p=0.026	Mean Time to Diagnosis	Time Range
ASCA-positive	10.0 yr	0 to 30 yr
ASCA-negative	4.8 yr	0 to 19 yr

Conclusions

➢Fecal and serum ASCA showed similar correlations to CD.

➢Most (67%) of non-Crohn's disease ASCA-positive patients were IBS patients.

➢ASCA-negative patients had a higher percentage of colonic CD while ASCA-positive showed a higher percentage of ileal involvement.

➢Time to diagnosis was significantly higher for ASCA-positive compared to ASCA-negative CD.

➢ASCA-positive results were not correlated to disease severity.

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