



Clinical Evaluation of the *IBD-CHEK*TM Test for Detecting Elevated Fecal Lactoferrin as an Indicator of Intestinal Inflammation in Pediatric Patients

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Introduction:

Abdominal pain and diarrhea are common clinical presentations that appear in pediatric gastroenterology. Following the elimination of infectious etiologies, the differential diagnosis between functional disorders such as irritable bowel syndrome (IBS) or the more severe conditions of inflammatory bowel diseases (IBD) has to be addressed. Medical history, physical findings and current laboratory parameters are not always conclusive in dealing with these assessments, often delaying a definitive diagnosis. A prompt diagnosis is essential for the optimization of medical therapy and patient care.

Recent and ongoing studies in adults support the measurement of fecal lactoferrin as an indicator of intestinal inflammation and by this means distinguish patients with IBD from those with IBS.

Aim of Study: To evaluate the clinical utility of detecting elevated levels of fecal lactoferrin in pediatric patients suffering from gastrointestinal illnesses, including those with active/inactive IBD, with IBS and various types of infectious diseases.

Methods: Fecal lactoferrin levels were determined qualitatively by an enzyme-linked immunoassay (*IBD-CHEK*TM; TechLab[®]). The test uses a rabbit polyclonal antibody specific for human lactoferrin. Fecal specimens were diluted 1:400 and analyzed by measurement of

the optical density (OD) at 450nm/630nm. Results of ≥ 0.200 (corresponding 4-8 μg lactoferrin/g wet weight of feces) were considered positive for elevated fecal lactoferrin.

Patients:

113 specimens from a total of 63 patients were analysed:

Ulcerative colitis (UC) and Indeterminate Colitis (IC): 52 tests from 19 patients, ages from 5.7 to 16.5 years, median 10.3 years.

Crohn's disease (CD): 22 tests from 11 patients, ages from 3.9 to 16.1 years, median 12.9 years.

Disease activity in IBD patients was determined by physicians assessment and Truelove index (UC) or PCDAI (CD).

Gastrointestinal Infections: 16 tests from 12 patients, ages from 0.5 to 26.5 years, median 6 years.

4 samples in the course of severe *C.difficile* colitis, 3 samples from 2 patients with cryptosporidiosis, 2 adenovirus, 4 ROTA-virus, 2 *Staph. aureus* colitis and one ROTA and Staph co-infection.

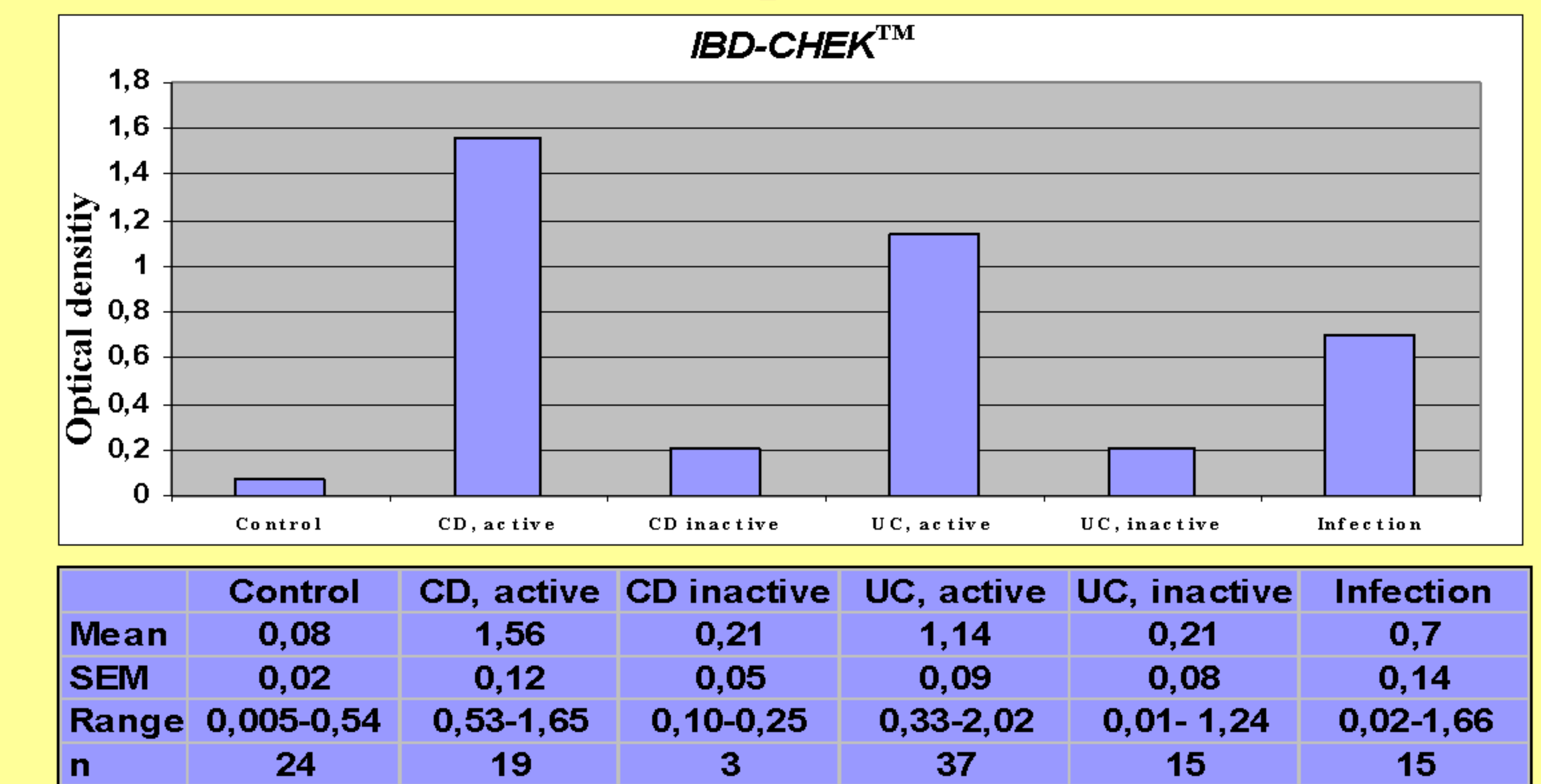
Controls: 24 tests from 22 patients, ages from 0.5 to 14.5 years, median 5.2 years. Most patients suffered from functional disorders such as recurrent abdominal pain, constipation or recurrent diarrhea, one patient each had autoimmune hepatitis, Goldenhar syndrome, Smith-Lemli-Opitz-syndrome, RSV bronchitis.

Conclusion:

The non-invasive *IBD-CHEK*TM test is a good test for indicating the presence of intestinal inflammation. In the clinical setting it can be used as a useful screening test for differentiating inflammatory from noninflammatory illnesses (IBS vs. IBD or infection, active/inactive IBD). Thus it will help to direct further diagnostics and therapy.

Results:

A) Optical densities depending of disease categories



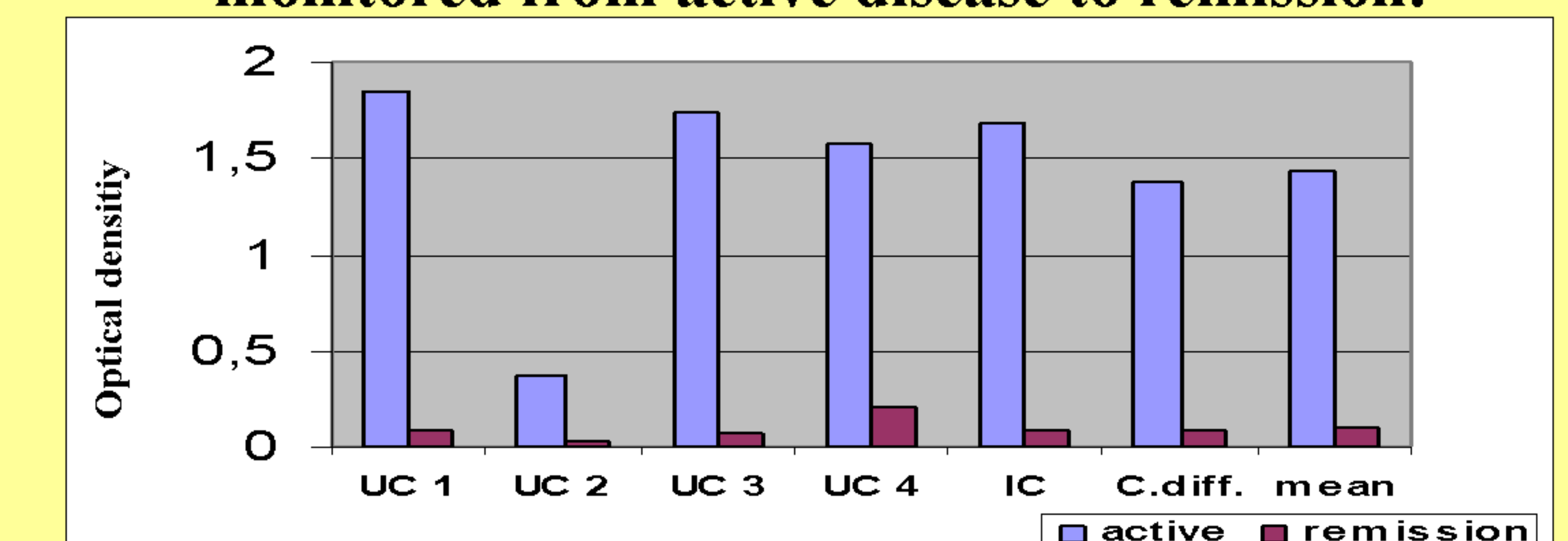
P-value control vs inactive CD .066, and control vs inactive UC .076, other differences vs control highly significant.

2 patients (8%) in the control group had OD >0.2: one had been hospitalized for infectious gastroenteritis 2 weeks before elsewhere, in the other child (Goldenhar syndrome) recurrent vomiting led to the suspicion of cow's milk protein intolerance and NeocateTM feeding was introduced.

3 specimen (5.8%) of 2 patients with UC were positive for lactoferrin although graded as well by Truelove index as by physician's assesment as inactive. Both patients were treated for a relapse of colitis one month later and 6 months later, respectively.

B) Lactoferrin in the change from inflammatory to noninflammatory state

6 patients (4 UC, 1 IC and 1 *C.difficile* colitis) were monitored from active disease to remission:



The mean reduction of factor 17.3 indicates a distinct differentiation between inflammatory and noninflammatory state.