Gastrointestinal disease in autism:

REPLICATION and SUPPORTIVE STUDIES

Key
*Replication studies at the Royal Free***
Replication of case series showing bowel disease in autism by independent groups[##]
*Invited articles**[#]

Wakefield AJ., Puleston J. Montgomery SM., Anthony A., O'Leary J.J., Murch SH Entero-colonic encephalopathy, autism and opioid receptor ligands. Alimentary Pharmacology & Therapeutics. 2002;16:663-674

**Torrente F., Machado N., Perez-Machado M., Furlano R., Thomson M., Davies S., Wakefield AJ, Walker-Smith JA, Murch SH. Enteropathy with T cell infiltration and epithelial IgG deposition in autism. Molecular Psychiatry. 2002;7:375-382

[**]Torrente F, Anthony A. Focal-enhanced gastritis in regressive autism with features distinct from Crohn's disease and helicobacter Pylori gastritis. Am J Gastroenterol 2004;99:598-605.

*[#]Wakefield AJ. The Gut-Brain Axis in Childhood developmental Disorders. Journal of Pediatric Gastroenterology and Nutrition. 2002;34:S14-S17

*[#]Wakefield AJ. Entero-colitis, Autism and Measles Virus. Consensus in Child Neurology. 2002;6:74-77

**Ashwood P, Anthony A, Pellicer AA, Torrente F, Wakefield AJ. Intestinal lymphocyte populations in children with regressive autism: Evidence for extensive mucosal immunopathology. Journal of Clinical Immunology, 2003;23:504-517

**Ashwood P, Anthony A, Torrente F, Wakefield AJ., Spontaneous mucosal lymphocyte cytokine profiles in children with regressive autism and gastrointestinal symptoms: Mucosal immune activation and reduced counter regulatory interleukin-10. Journal of Clinical Immunology. 2004:24:664-673

**Ashwood P, Wakefield AJ. Immune activation of peripheral blood and mucosal CD3+ lymphocyte cytokine profiles in children with autism and gastrointestinal symptoms. J Neuroimmunol. 2006;173:126-34

**Anthony A, Ashwood P., Wakefield AJ. The significance of ileo-colonic lymphoid nodular hyperplasia in children with autistic spectrum disorder. European Journal of Gastroenterology and Hepatology 2005;17:827-36

**Furlano RI, et al. Colonic CD8 and gamma delta T-cell infiltration with epithelial damage in children with autism. J Pediatr. 2001;138:366-72.

**Wakefield AJ, Ashwood P, Limb K, Anthony A. The significance of ileo-colonic lymphoid nodular hyperplasia in children with autistic spectrum disorder. Eur J Gastroenterol. Hepatol. 2005;17:827-36.

*[#]Wakefield AJ. Enterocolitis, autism and measles virus. Mol Psychiatry. 2002;7 Suppl 2:S44-6.

[*#]Wakefield AJ, et al. Autism, viral infection and measles-mumps-rubella vaccination. Israeli Med Assoc J. 1999 Nov;1(3):183-7.

Wakefield AJ. MMR vaccination and autism. Lancet. 1999;354:949-50.

Afzal N, et al. Constipation with acquired megarectum in children with autism. Pediatrics. 2003;112:939-42.

##Balzola F, Barbon V, Repici A, Rizzetto M. Panenteric IBD-like disease in a patient with regressive autism shown for the first time by the wireless capsule enteroscopy: another piece in the jigsaw of this gut-brain syndrome? Am J Gastro. 2005; 979-981. (Italian replication)

##Balzola F, et al. Autistic enterocolitis: confirmation of a new inflammatory bowel disease in an Italian cohort of patients. Gastroenterology.2005;128:Suppl.2;A-303. . (Italian replication)

##Balzola F, et al. Beneficial behavioural effects of IBD therapy and gluten/casein-free diet in an Italian cohort of patients with autistic enterocolitis followed over one year. Gastroenterology, 2006:30; suppl. 2 S1364 A-21. . (Italian replication)

Buie T, et al. Evaluation, diagnosis, and treatment of gastrointestinal disorders in individuals with ASDs: a consensus report. Pediatrics. 2010;125 Suppl 1:S1-18.

Buie T, Fuchs GJ 3rd, Furuta GT, Kooros K, Levy J, Lewis JD, Wershil BK, Winter H. Recommendations for evaluation and treatment of common gastrointestinal problems in children with ASDs. Pediatrics. 2010;125 Suppl 1:S19-29.

Cade R, et al. Autism and schizophrenia: intestinal disorders. Nutritional Neuroscience 3: 57-72, 2000.

Cade JR, et al. Autism and schizophrenia linked to malfunctioning enzyme for milk protein digestion. Autism, Mar 1999.

##Chen B, Girgis S, El-Matary W. Childhood autism and eosinophilic colitis. Digestion. 2010;81:127-9. (Canadian replication)

DeFelice ML, et al. Intestinal cytokines in children with pervasive developmental disorders. Am J Gastroenterol 2003;98:1777-82:

D'Eufemia P, et al. Abnormal intestinal permeability in children with autism. Acta Paediatr. 1996;85:1076-9.

##Galiatsatos P, et al. Autistic enterocolitis: fact or fiction? Can J Gastroenterol 2009;23:95-98. (Canadian replication)

Genuis SJ, Bouchard TP. Celiac Disease Presenting as Autism. J Child Neurol. 2009

##Gonzalez L, Lopez K, Navarro D, Negron L, Flores L, Rodriguez R, Martinez M, Sabra A. Endoscopic and Histological Characteristics of the digestive mucosa in autistic children with gastrointestinal symptoms. Arch Venez Pueric Pediatr 69;1:19-25 (Venezuelan replication)

##Horvath K et al. Gastrointestinal abnormalities in children with autistic disorder. J Pediatr. 1999;135:559-63. (US replication)

Horvath K, Perman JA. Autism and gastrointestinal symptoms. Curr Gastroenterol Rep.2002;4:251-8.

##Horvath K, Perman JA. Autistic disorder and gastrointestinal disease. Curr Opin Pediatr.2002;14:583-7.

Kawashima H et al. Detection and sequencing of measles virus from peripheral mononuclear cells from patients with inflammatory bowel disease and autism. Dig Dis Sci. 2000;45:723-9.

Kushak R, Winter H, Farber N, Buie T. Gastrointestinal symptoms and intestinal disaccharidase activities in children with autism. Abstract of presentation to the North American Society of Pediatric Gastroenterology, Hepatology, and Nutrition, Annual Meeting, October 20-22, 2005, Salt Lake City, Utah.

D'Eufemia P, Celli M, Finnochiaro R, et al. Abnormal intestinal permeability in children with autism. *Acta Pediatrica.* 1996;85:1076-1079.

Horvath K, Collins RM, Rabsztyn R et al. Secretin improves intestinal permeability in autistic children. J. Ped. Gastroenterol. Nutr. 2000;S31:31

De Magistris L, Familiari V, Pascotto A, et al. Alterations of the intestinal barrier in patients with autism spectrum disorders and in their first-degree relatives. J Pediatr Gastroenterol Nutr. 2010;51:418-24.

Knivsberg AM, Reichelt KL, Hoien T, Nodland M. A randomised, controlled study of dietary intervention in autistic syndromes. *Nutr Neurosci.* 2002;5:251–61.

##Krigsman A, Boris M, Goldblatt A et al. Clinical Presentation and Histologic Findings at Ileocolonoscopy in Children with Autistic Spectrum Disorder and Chronic Gastrointestinal Symptoms. Autism Insights 2010;2:1-11 (US replication)

McGinnis WR. Mercury and autistic gut disease. Environ Health Perspect. 2001;109:A303-4.

Melmed RD, Schneider CK, Fabes RA. Metabolic markers and gastrointestinal symptoms in children with autism and related disorders. J Pediatr Gastroenterol Nutr 2000:31;S31-32.

Nikolov, RN, et al, Gastrointestinal symptoms in a sample of children with pervasive developmental disorders. J Autism Dev Disord. 2009;39:405-13.

Parracho HM, Bingham MO, Gibson GR, McCartney AL. Differences between the gut microflora of children with autistic spectrum disorders and that of healthy children. J Med Microbiol. 2005;54:987-91.

Quigley EM, Hurley D. Autism and the gastrointestinal tract. Am J Gastroenterol. 2000;95:2154-6.

Reichelt KL, Knivsberg AM. Can the pathophysiology of autism be explained by the nature of the discovered urine peptides? Nutr Neurosci. 2003;6:19-28.

Reichelt KL, et al. Probable Etiology and Possible Treatment of Childhood Autism. Brain Dysfuntion 1991;4:308-319.

Reichelt KL, Knivsberg AM. The possibility and probability of a gut-to-brain connection in autism. Ann Clin Psychiatry. 2009;21:205-11.

Sandler RH, et al. Short-term benefit from oral vancomycin treatment of regressive onset autism. J Child Neurol. 2000;15:429.

Schneider CK, Melmed RD, Barstow LE, Enriquez FJ, Ranger-Moore J, Ostrem JA. Oral Human Immunoglobulin for Children with Autism and Gastrointestinal Dysfunction: A Prospective, Open-Label Study. J Autism Dev Disord. 2006 Jul 15.

Song Y, Liu C, Finegold SM. Real-time PCR quantitation of clostridia in feces of autistic children. Appl Environ Microbiol. 2004;70:6459-65.

Taylor B, Miller E, Lingam R, Andrews N, Simmons A, Stowe J. Measles, mumps, and rubella vaccination and bowel problems or developmental regression in children with autism: population study. BMJ. 2002;324:393-6.

Valicenti-McDermott M, et al. Frequency of gastrointestinal symptoms in children with autistic spectrum disorders and association with family history of autoimmune disease. J Dev Behav Pediatr. 2006;27:S128-36.

Valicenti-McDermott MD, McVicar K, Cohen HJ, Wershil BK, Shinnar S. Gastrointestinal symptoms in children with an autism spectrum disorder and language regression. Pediatr Neurol. 2008;39:392-8.

Welch MG, Welch-Horan TB, Anwar M, Anwar N, Ludwig RJ, Ruggiero DA. Brain effects of chronic IBD in areas abnormal in autism and treatment by single neuropeptides secretin and oxytocin. J Mol Neurosci 2005;25:259-74.

White JF. Intestinal pathophysiology in autism. Exp Biol Med. 2003 Jun;228 (6):639-49.

Whiteley P, Shattock P. Biochemical aspects in autism spectrum disorders: updating the opioid-excess theory and presenting new opportunities for biomedical intervention. Expert Opin There Targets. 2002 Apr;6(2):175-83.

Lucarelli S, Frediani T, Zingoni AM, et al Food allergy and infantile autism. Panminerva Med. 1995;37:137-41.

Whitely P, Haracopos D, Knivsberg AM, Reichelt KL, Parlar S, Jacobsen J, Seim A, Pedersen L, Schondel M, Shattock P. The ScanBrit randomised, controlled, single-blind study of a gluten- and casein-free dietary intervention for children with autism spectrum disorders. Nutr Neurosci. 2010;13:87-100.

H Jyonouchi, Geng L, Ruby A, Reddy C, et al. Dysregulated Innate Immune Responses in Young Children with Autism Spectrum Disorders: Their Relationship to Gastrointestinal Symptoms and Dietary Intervention. J Pediatr 2005;146:605-10

Jyonouchi H. Food Allergy and Autism Spectrum Disorders: Is There a Link? Curr Allergy Asthma Rep. 2009;9:194-201