

# Gluten- and casein-free diets for autistic spectrum disorder

Claire Millward<sup>2</sup>, Michael Ferriter<sup>1</sup>, Sarah J Calver<sup>3</sup>, Graham G Connell-Jones<sup>4</sup>

<sup>1</sup>Literature and Evidence Research Unit (LERU), Institute of Mental Health, Nottinghamshire Healthcare NHS Trust, Woodbeck, UK. <sup>2</sup>Department of Clinical Psychology, Derbyshire Children's Hospital, Derby, UK. <sup>3</sup>Child & Family Consultation Services, 24 Norton Road, Essex, UK. <sup>4</sup>Annesley House, Mansfield Road, Annesley, UK

Contact address: Michael Ferriter, Literature and Evidence Research Unit (LERU), Institute of Mental Health, Nottinghamshire Healthcare NHS Trust, The Clair Chilvers Centre, Rampton Hospital, Woodbeck, Nottinghamshire, DN22 OHU, UK. [Michael.Ferriter@nottshc.nhs.uk](mailto:Michael.Ferriter@nottshc.nhs.uk).

**Editorial group:** [Cochrane Developmental, Psychosocial and Learning Problems Group](#).

**Publication status and date:** Edited (no change to conclusions), published in Issue 1, 2009.

**Review content assessed as up-to-date:** 1 April 2007.

**Citation:** Millward C, Ferriter M, Calver SJ, Connell-Jones GG. Gluten- and casein-free diets for autistic spectrum disorder. *Cochrane Database of Systematic Reviews* 2008, Issue 2. Art. No.: CD003498. DOI: 10.1002/14651858.CD003498.pub3.

Copyright © 2009 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

---

## Abstract

### Background

It has been suggested that peptides from gluten and casein may have a role in the origins of autism and that the physiology and psychology of autism might be explained by excessive opioid activity linked to these peptides. Research has reported abnormal levels of peptides in the urine and cerebrospinal fluid of people with autism.

### Objectives

To determine the efficacy of gluten and/or casein free diets as an intervention to improve behaviour, cognitive and social functioning in individuals with autism.

### Search strategy

The following electronic databases were searched: CENTRAL(The Cochrane Library Issue 2, 2007), MEDLINE (1966 to April 2007), PsycINFO (1971 to April 2007), EMBASE (1974 to April 2007), CINAHL (1982 to April 2007), ERIC (1965 to 2007), LILACS (1982 to April 2007), and the National Research register 2007 (Issue1). Review bibliographies were also examined to identify potential trials.

### Selection criteria

All randomised controlled trials (RCT) involving programmes which eliminated gluten, casein or both gluten and casein from the diets of individuals diagnosed with an autistic spectrum disorder.

### Data collection and analysis

Abstracts of studies identified in searches of electronic databases were assessed to determine inclusion by two independent authors. The included trials did not share common outcome measures and therefore no meta-analysis was possible. Data are presented in narrative form.

### **Main results**

Two small RCTs were identified (n = 35). No meta-analysis was possible. There were only three significant treatment effects in favour of the diet intervention: overall autistic traits, mean difference (MD) = -5.60 (95% CI -9.02 to -2.18), z = 3.21, p=0.001 (Knivsberg 2002) ; social isolation, MD = -3.20 (95% CI -5.20 to -1.20), z = 3.14, p = 0.002) and overall ability to communicate and interact, MD = 1.70 (95% CI 0.50 to 2.90), z = 2.77, p = 0.006) (Knivsberg 2003). In addition three outcomes showed no significant difference between the treatment and control group and we were unable to calculate mean differences for ten outcomes because the data were skewed. No outcomes were reported for disbenefits including harms.

### **Authors' conclusions**

Research has shown of high rates of use of complementary and alternative therapies (CAM) for children with autism including gluten and/or casein exclusion diets. Current evidence for efficacy of these diets is poor. Large scale, good quality randomised controlled trials are needed.

---

## **Plain language summary**

### **Gluten and casein-free diets for autism spectrum disorder**

It has been suggested that peptides from gluten and casein may have a role in the origins of autism and that the physiology and psychology of autism might be explained by excessive opioid activity linked to these peptides.

An extensive literature search was carried out to identify any randomised control trials of gluten and/or casein free diet as an intervention to improve behaviour, cognitive and social functioning in individuals with autism. Only three papers reporting on two randomised control trial were identified, two small scale trials the first with ten participants in each arm of the trial and the second with fifteen participants recruited into the trial. The results for the first study indicated that a combined gluten and casein free diet reduced autistic traits and the second study showed no significant difference in outcome measures between the diet group and the control group. This is an important area of investigation and large scale, good quality randomised control trials are needed. None of the studies reported on adverse outcomes or potential disbenefits.

There is evidence of widespread use by parents of complementary and alternative therapies (CAM) including exclusion diets for their children with autism. Despite this, there is a lack of evidence to support the use of gluten and/or casein free diet as an effective intervention for persons with autism and also a lack of research on potential harms and disbenefits of such diets. Despite the problems of maintaining the integrity of

such diets in the community it is possible to carry out randomised control trials to address these questions and more and adequately powered trials are needed in this area.