

Diet and Autistic Spectrum Disorder (ASD)

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Overview

- Features of nutrition quackery
- Diet in the etiology of ASD
- Diet-related attributes / challenges associated with ASD
- A risk management framework for dietary intervention
- **Whats “out there” discussion**
- Review of popular dietary interventions for ASD + practical considerations
- Questions

ASD and Pseudo science

Several features of ASD render it fertile ground for pseudo science

- Diagnosis can be devastating news >>>parents highly motivated to try treatments
- Great deal of variability in response to treatments
- Spontaneous developmental gains occur
- Very limited quality research that provides scientific proof at a level that supports intervention decisions

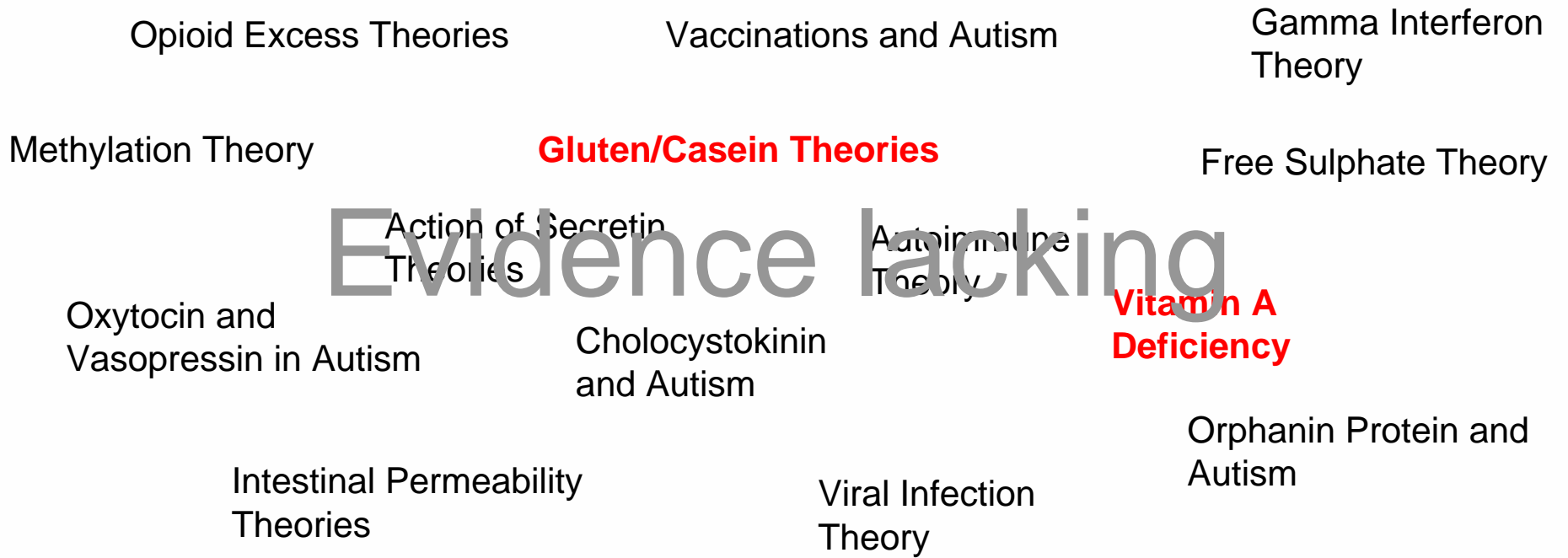
Features of quackery/ pseudo science

- Claims that treatment is scientifically verified
- Exaggerated claims of effectiveness outside range of accepted procedures
- Rely on testimonial and anecdote rather than controlled studies
- Results are selectively reported
- Promoted through internet or sales publications rather than peer-reviewed journals
- Promoted by those with direct financial stakes in treatments

We need to :

- Be open-minded but critical
- Consider the potential for quackery
- Seek professional advice when unsure
- Science does not have all the answers –yet?
- Use a risk management approach to individual decision making (to be outlined)

Many theorised etiologies of Autism



Etiology

There is no empirical evidence that ASD is caused by:

- Unloving mothers (Psychoanalytical)
- Yeast infections (candida)
- Childhood vaccinations (MMR etc)

Evidence points to genetic predisposition and various early environmental insults to the developing fetus

Herbert, Sharp, Gaudiano. Separating fact from fiction in the etiology and treatment of Autism: A scientific review of the evidence. *Sci Rev Mental Hth Pract*

www.quackwatch.org

Diet Related attributes/ challenges

- Picky/faddy eating
- Craving/Dislike for certain foods
- Pale skin/pasty face
- Eats non foods e.g. earth, sand, paper, soap
- Dark shadows under the eyes
- Gut disorders in the family
- Bloating
- Swollen stomach
- Diarrhoea
- Constipation
- Breaking wind frequently

>>>>Concern about adequacy of diet, nutritional status , increased risk of deficiencies

Risk Management Approach to Diet Intervention

1. **Do No Harm**

2. **Costs**

3. **Benefits**

4. **Duration**

5. **Plausibility**

6. **Practicality**

7. **Content**

Risk Management Approach to Diet Intervention

1. **Do No Harm**

Does changing the diet compromise nutritional status?

Could changing the diet / taking supplements lead to toxicity?

Could changing the diet interfere with other nutrients?

Risk Management Approach to Diet Intervention

2. Cost

What are the financial, social and emotional costs to the family?

Opportunistic costs?

Risk Management Approach to Diet Intervention

3. **Benefits**

Is there evidence of the benefit?

Anecdotal or Measurable?

Do benefits outweigh costs/risks?

Risk Management Approach to Diet Intervention

4. Duration

Is this diet change required for a short period or forever?

Risk Management Approach to Diet Intervention

5. Plausibility

Is there a rational basis for the treatment?

Risk Management Approach to Diet Intervention

6. Practicality

Is there a protocol?

Can the diet change be implemented and sustained?

Risk Management Approach to Diet Intervention

7. Content

Are you aware of what changes are being made?

Do you know what is in the product/supplement/food?

Get professional advice

GROUP DISCUSSION

What are some of the diet therapies you are aware of?

What do they involve?

PLEASE DISCUSS

Two dietary interventions reviewed using the RMF

- Casein/Gluten free diet
- Vit B6/ Magnesium supplementation

Gluten/Casein Free Diet

GLUTEN

Formed by the proteins glutenin and gliadin. It is the insoluble protein constituent of wheat and other grains.

Found in any food that contains the grains:

wheat, rye, barley, oats

Also found in less obvious foods, such as certain types of:

malt or malt flavourings, hydrolyzed vegetable proteins (HVP), modified starches, vegetable gums, soy sauces

Furthermore, If a product contains the words stabilizer, starch, flavouring, emulsifier or hydrolysed plant protein it means a grain containing gluten has been used.

Gluten/Casein Free Diet

CASEIN

The principle protein in cows milk.

Found in any cows milk dairy products. Also found in foods with the following ingredients: cheese, curds, milk proteins and milk solids.

Caseins are used as extenders, tenderizers, nutritional fortifiers and texturisers and can be found in less obvious foods such as:

coffee whiteners, formulated meats, sauces, fortified cereals, soups and nutrition bars/supplements.

Gluten/Casein Free Diet

RATIONALE:

Reichelt et al (1991) - Peptides from gluten and casein were crossing the gut and leading to excessive opioid activity. This increased in opioid activity is suggested to enhance behaviours noted in Autistic Spectrum Disorders.

Shattock et al (1990) – Increased 24 hour urine peptide excretion and increased opioid levels in cerebrospinal fluid of Autistic children

Cochrane Review (2004) – Some anecdotal evidence for a gluten/casein free diet for autism however without urgently needed randomised controlled trials there is **insufficient evidence for clinicians to advise their use.**

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

1. **Do No Harm**

- Further restricting a limited diet
- Eliminating a major source of dietary calcium.
- Minimal chance of toxicity

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

2. **Cost**

Financial – GF foods more expensive

Time- Availability of GF foods. Many GF foods sold as ingredient mix (require baking)

Social- Typically requires entire family to change diet

Emotional- Implementation of diet can be highly stressful

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

3. Benefits

- Knivsberg (2002) study showed significant reduction in autistic traits when treated with a combined GF/CF diet
- Strong anecdotal evidence via case studies
- Good quality, adequately powered randomised controlled trials needed

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

4. Duration

- Initial GF/CF trial period of 3 months (Shattock et.al. 1999)
- Diet is to be continued until the integrity of membranes of intestine and blood-brain barrier has been restored (Shattock et.al. 1999).
- How easy is this to monitor???

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

5. Plausibility

OPIOID EXCESS THEORY

- Increased intestinal permeability to peptides
- Peptides become biologically active through binding with opioid receptors
- Excess of opioids lead to behaviours noted in ASD

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

6. Practicality

‘THE SUNDERLAND PROTOCOL’

- **Stage 1- Remove Gluten/Casein from diet. Effects normally seen after 3 weeks for casein and 3 months for gluten.**
- **Stage 2- Remove other foods thought to be a problem. E.g. soya, tomatoes, avocado, pears and beef**

‘THE SUNDERLAND PROTOCOL cont..’

Stage 2

- Test for allergies and deficiencies of vitamins/minerals and supplement as appropriate.
- Treat parasitic organisms. Eg. Yeasts and bacteria.

Stage 3

- Address lack of sulphation using epsom salts in the bath.
- Attempt to improve digestion of peptides using betaine hydrochloride and enzyme supplements. (Widely used in US)

(Shattock et.al 1999)

Risk Management Approach to Diet Intervention Gluten/Casein Free Diet

7. Content

- Are you aware of the nutrient contents of each supplement?
- Are the foods completely free of gluten and casein?

References

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Vitamin B6-Magnesium Treatment

VITAMIN B6 (Pyridoxine)

Functions- coenzyme in metabolism of amino acids, neurotransmitters, glycogen, heme, steroids and sphingolipids.

Sources in Food -meats, wholegrain products (especially wheat), vegetables and nuts. Greater bioavailability in animal products.

Deficiency- symptoms of weakness, sleepiness, peripheral neuropathies, impaired immunity

Vitamin B6-Magnesium Treatment

MAGNESIUM

Functions – involved in synthesis of protein, assists certain enzymes in their function.

Sources in Food – vegetables (green leafy), fruit, soy products, legumes, nuts and whole grains

Deficiency – muscle weakness, fatigue, hyperexcitability and sleepiness. (Very rare)

Vitamin B6-Magnesium Treatment

RATIONALE:

Bonisch (1968) first to report improved speech and language in children with autism after mega-doses of Vitamin B6.

Rimland et.al (1978) found undesirable side effects (irritability, hypersensitivity to sound, enuresis) of B6 therapy could be countered with doses of Mg.

Rationale primarily based on role of Vitamin B6 in neurological development/function

Cochrane Review (2005) conclude **not enough evidence to demonstrate treatment efficacy**. Due to the small numbers, methodological quality and small sample sizes of previous studies.

Risk Management Approach to Diet Intervention

Vitamin B6-Magnesium Treatment

1. **Do No Harm**

- Treatment is not expected to compromise nutritional status
- Evidence that megadoses (>100mg per day) can lead to patients suffering numbness and tingling in hands and feet due to peripheral neuropathy. Note: Mg was not given with the B6
(Schaumburg 1983)
- **Magnesium supplementation may interfere with Zinc and calcium absorption**

Risk Management Approach to Diet Intervention Vitamin B6-Magnesium Treatment

2. **Cost**

- Financial cost associated with regular supplementation

Risk Management Approach to Diet Intervention Vitamin B6-Magnesium Treatment

3. Benefits

- Rimland (1988) concluded significant improvement in eye contact, less self-stimulatory behaviour, more interest in surroundings, fewer tantrums and better speech
- Large amount of anecdotal evidence????
 - autistic people have been taking large doses of B6 for decades without experiencing any adverse effects (Kidd 2002)?????

Risk Management Approach to Diet Intervention Vitamin B6-Magnesium Treatment

4. Duration

- This has varied in intervention studies from 4-20 weeks.
- Anecdotal evidence suggest the treatment is ongoing.

Risk Management Approach to Diet Intervention

Vitamin B6-Magnesium Treatment

5. **Plausibility**

- Vogelaar (2000) reported on nutrient status of 20 autistic children. Over 50% had low levels of vitamins A, B1, B3, B5 and biotin and the minerals selenium, zinc and magnesium. Vitamin B6 levels were adequate
- Other clinicians report frequent deficiencies of vitamins B6 and B12 (Kidd 2002)

Supplementation effects may be due to nutrient repletion???

Risk Management Approach to Diet Intervention Vitamin B6-Magnesium Treatment

6. **Practicality**

- Regular consumption of capsules- **Easy to administer???**

Risk Management Approach to Diet Intervention Vitamin B6-Magnesium Treatment

7. **Content**

- Does the supplement contain only vitamin B6 /Magnesium?

References

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Questions???