Dietary adequacy of Egyptian children with autism

Presented by

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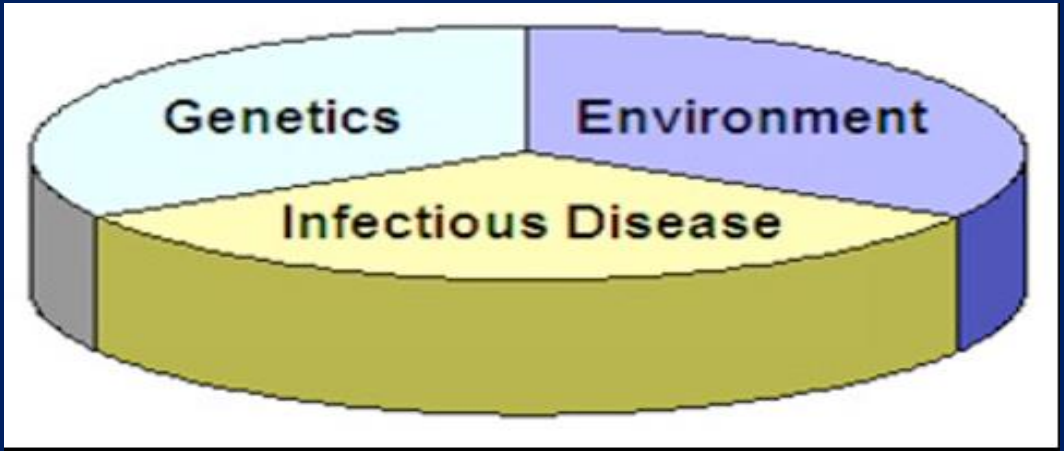
Autism

- Problems with **socialization**
- Problems with **communication**
- Unusual **behaviors**

Autism is Multifactorial in nature:

- genetic components, infectious components and environmental components. While the relative contribution of each of these components may differ from one individual to the next
- Each of these components does play a role for all of us. A certain threshold or body burden needs to be met for each of these factors in order for multifactorial disease to occur.



By the end of 7 months

- Smile back at another person
- Respond to sound with sounds
- Enjoy social play

Red Flags

- No big smiles or other warm, joyful expressions
- No back-and-forth sharing of **sounds**, smiles, or other facial expressions by nine months or thereafter

By the end of 1year

- Use simple gestures
- Imitate actions in their play
- Respond when told “no”

Red Flags

- **No back-and-forth gestures, such as pointing, or waving bye**
- **Not answering to one’s name when called**
- **No babbling – mama, dada, papa**

By the end of 18 months

- Do simple pretend play
- Point to interesting objects
- Use several single words unprompted

Red Flags

- No single words by 18 months
- No simple pretend play

By the end of 2 years (24 months)

- Use 2- to 4-word phrases
- Follow simple instructions
- Become more interested in other children
- Point to object or picture when named

Red Flags

- No two-word meaningful phrases (without imitating or repeating)
- Lack of interest in other children

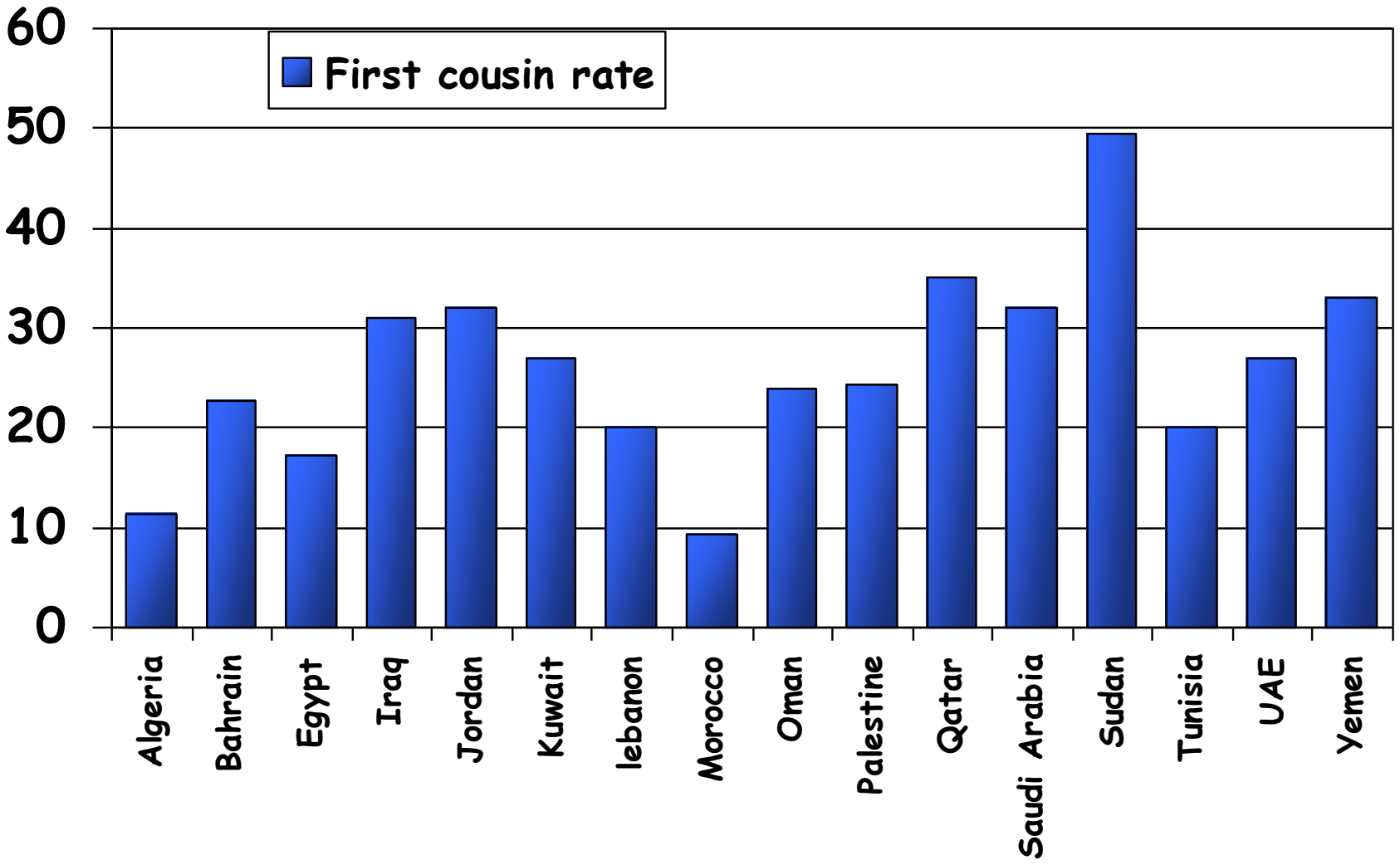
- **Autism is still poorly understood, a number of environmental, anthropological, neurobiological and genetic factors have been related to the pathophysiology of ASD, even the impact of oxidative stress response related to the environment and nutrition intake.**

- To determine the associated risk factors in Egypt, we studied pedigree charts, degree of consanguinity of parents and family history of similarly affected infants or children. Males were more affected than females. Only 30% of the mothers received

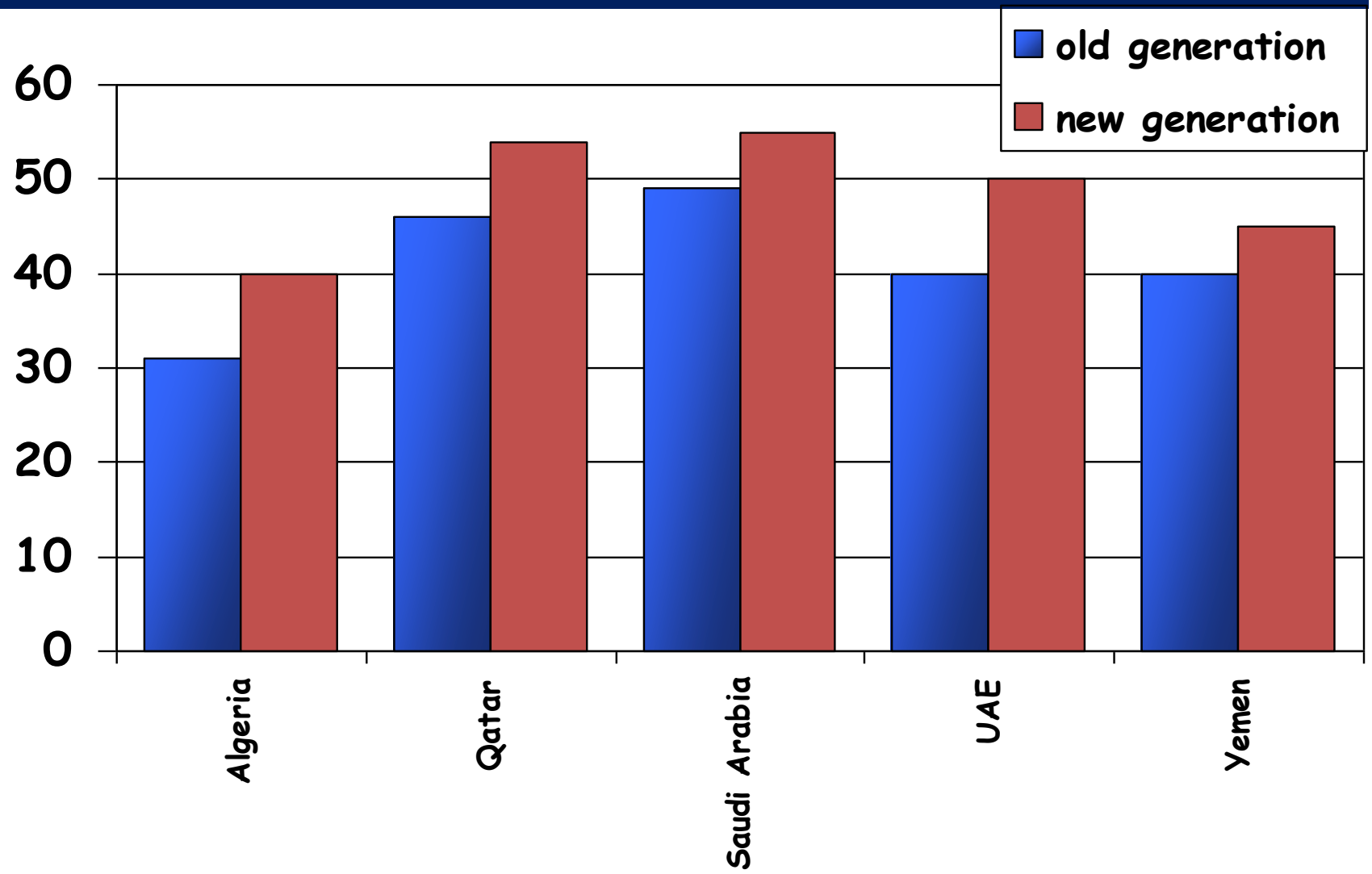
- **Antenatal care only, 15% received multivitamins and folic acid during pregnancy. This high-lights the importance of measures for health promotion and disease prevention**

- **In child bearing-age women should pay special attention to prenatal care and childbirth which can influence neonatal indicators and prevention of birth defects.**

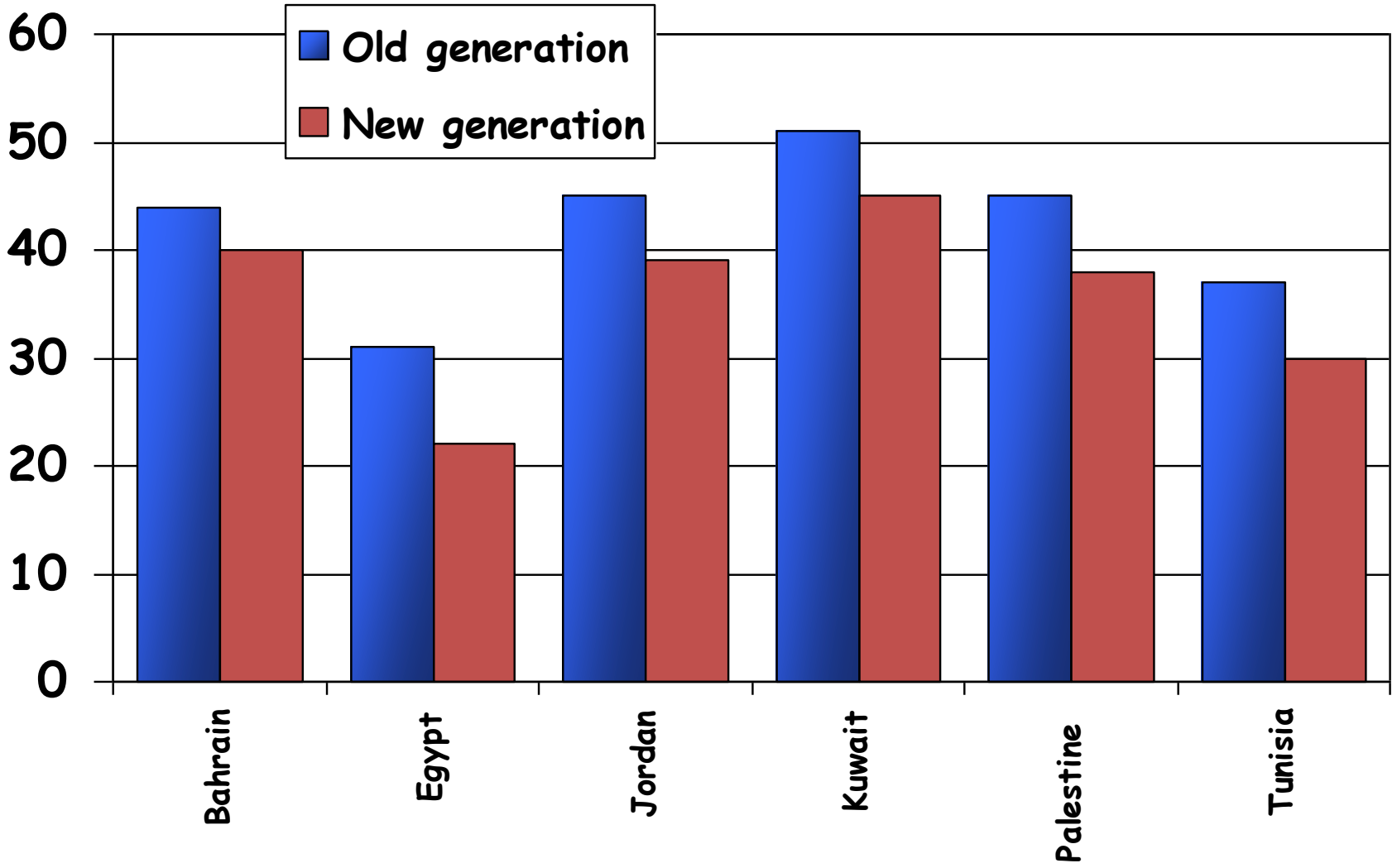
consanguinity Rate Among Arabs



Increase in consanguinity rates over time among some Arab countries



Decrease in consanguinity rates over time among some Arab countries



- **Future breakthroughs will profit greatly from the application of evidence-based approaches to therapy. In this regard, studies of monogenic ASD have much to offer with regard to detailed characterization of a subset of ASD.**

- **Although most studies have shown that individuals with autism have selective eating habits and their dietary intake is often below the recommended panels of daily amounts, so they may be at risk for vitamin and mineral insufficiency.**

- **Subjects with autism are now recognized as belonging to a complex multifactorial pathology, where neurological patterns and severity are related to an etiology involving interactions between genes, environment, diet, and gender**

- **The present study aimed at comparing dietary regimens and habits of normally developing apparently healthy children with a pediatric population of individuals affected by autistic disorder.**

- A total of 80 children with autistic disorder and 80 apparently healthy, normally developing pediatric individuals were enrolled in this work.

- **Specialized dietitian** got food frequency questionnaire from parents of all participants.

  The parents of each subject were requested to provide three days food diary of their children for two weekdays and one weekend (covering the consumption over 24 h on each of the three days).

Individual food intake was calculated and analyzed using Computer Aided Nutritional Analysis Program, the food composition (National Nutrition Institute, Cairo, Egypt).

- Serum **magnesium** (Mg), **iron** (Fe), and **calcium** (Ca) were measured by colorimetric methods using quantitative colorimetric BioAssay Systems kits

- Serum vitamin **B12, folic acid, and vitamin B6** were measured by enzyme-linked immunosorbent assay (ELISA) using DRG kits

- **Results**
- Plotting on the Egyptian sex-specific anthropometric growth (auximetric) chart, **absolute weights** as well as weight-related for age classes, were **significantly higher in cases than healthy controls.**
- No differences between groups were observed in regard to total kilocalories (kcal), carbohydrates, and fat intake.

- A total of 23.8% of children with autistic disorder vs. 11.3% in the healthy control group had a nutrient intake with features below the (RDA) of protein.

- Children with autistic disorder showed low dietary intake of micronutrients; calcium (Ca), magnesium (Mg), iron (Fe), andselenium(Se) also they had significantly high intake of potassium (K) and vitamin C compared to healthy controls.

- **Serum Mg, Fe, Ca, folate and vitamin B12 in children with autistic disorder were significantly low compared with healthy children.**

- These results confirmed that **different nutritional inadequacy** was observed in Egyptian children with autistic disorder.

Interventions for Autism

Any intervention for Autism needs to bear in mind three very important factors that will affect outcome:

(1) Autism is Heterogeneous.

(2) Autism is often accompanied by co-morbidities.

e.g. epilepsy, ADHD, anxiety-related problems

(3) Age and environment may play a role.

Could diet affect Autism?

- **Screening of the nutritional status of Autism children for nutrient adequacy to reduce these deficiencies by dietary means or by administering appropriate vitamin and mineral supplements.**

Diet & health are linked: not just another "casual" relationship!

Mean and the standard deviation (Mean ± SD) for 80 children with autistic disorder and 80 controls

Variable	Cases Mean ± SD	Control Mean ±SD	P Value
Kilocalories (Kcal/d)	1116.2 ± 271.6	1136.5 ± 269.4	0.317
Protein (gm/d)	36.6 ± 10.3	39.7 ± 8.7	0.021
Fat (gm/d)	43.2 ± 12.8	45.0 ± 11.1	0.233
Fibers (gm/d)	1.4 ± 0.4	0.715 ± 0.2	0.001
Carbohydrates (gm/d)	145.3 ± 22.3	143.0 ± 32.4	0.303
Protein energy ratio status	13.6 ± 4.4	14.2 ± 2.9	0.309
Carbohydrate energy ratio status	52.8 ± 9.7	51.5 ± 8.5	0.343
Fat energy ratio status	33.6 ± 9.6	34.4 ± 7.8	0.576

Variable	Cases Mean ± SD	Control Mean ± SD	P Value
Vitamin A (mg/d)	159.6 ± 30.9	161.8 ± 46.7	0.359
Vitamin B1 (mg/d)	0.27 ± 0.08	0.28 ± 0.07	0.27
Vitamin B2 (mg/d)	0.47 ± 0.12	0.5 ± 0.13	0.052
Vitamin B6 (mg/d)	0.91 ± 0.16	0.6 ± 0.15	0.001
Folic acid (mg/d)	197.75 ± 34.22	269.48 ± 20.90	0.001
Vitamin B12 (mg/d)	0.39 ± 0.12	0.85 ± 0.15	0.001
Vitamin C (mg/d)	23.2 ± 6.8	17.7 ± 4.7	0.001

Variable	Cases Mean ±SD	Control Mean ±SD	P Value
Calcium (mg/d)	468.113 ±109.6	817.258±114.6	0.001
Iron (mg/d)	8.821 ± 2.6	14.421 ± 2.3	0.001
Phosphorus (mg/d)	468.2± 119.9	469.7± 122.7	0.467
Magnesium (mg/d)	85.63± 22.39	150.98 ± 26.02	0.001
Zinc (mg/d)	4.6± 1.4	4.8± 1.3	0.185
Selenium (mg/d)	7.3± 2.0	8.3± 2.3	0.004

Feeding problems in children with ASD

Food Selectivity +
Food refusal +
Obsessive eating patterns >Concern for nutritional deficits and possible imbalances

HOW DO I GET MY KID TO EAT THIS STUFF?

- **we need to eat a LOT of vegetables to get enough carbohydrate calories for a balanced diet. Our strategy was to control the plate, and insist on "First peas, then steak" for example. So we would alternate bites, for the entire meal.**

Conclusions

- **Nutritional inadequacies were observed in children with autistic disorder. So n**utritional status of children with autism should regularly be screened for nutrient adequacy to reduce these deficiencies by dietary means or by administering appropriate vitamin and mineral supplements

- **Exclusion diets may be helpful in ameliorating some of the core and/or secondary symptoms of Autism for some people.**

- **The present study lends further support to properly designed individualized nutritional therapy which may relieve autistic symptoms and the occurrence of gastrointestinal disorders**

Conclusions

Finally,

- Evidence for the use of diet as good as most other interventions (specialised education/behavioural plans).

- Parents and caregivers should, therefore, be aware of the benefits of nutritional therapy, especially in developing countries.

Collaborators

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Thank You