

Gluten Sensitivity Screening in Children with Down's syndrome.

*Anil B. Jalan **, *Judith Vaz ***, *Chandralata Sharma****

NIRMAN, 203, Nirman Vyapar Kendra, Sector 17, Vashi – Navi-Mumbai, India.

* Chief Scientific Research Officer (Bio – chemical Genetics)

** Chief Neuro – developmental Physiotherapist

*** Speech Therapist And Audiologist

Objective:- To estimate incidence of Gluten sensitivity in children with Down's syndrome. Incidence of Gluten Sensitivity is supposed to be higher than normal population in these children (1,2). The effectiveness of Antigliadin Antibody testing as a screening procedure for Gluten sensitivity and Coeliac Disease also has been established beyond doubt. (3).

Introduction:- Coeliac disease or gluten sensitivity is induced by a sensitivity to the gliadin fraction of Gluten, a protein found primarily in wheat, rye, barley & oats. The clinical presentation of coeliac disease varies greatly. Generally it causes chronic diarrhea, failure to thrive, delayed puberty and anemia (4). Many patients do not have gastrointestinal symptoms or signs of malabsorption (3). In recent years, assays for circulating antibodies have been the main focus of studies on celiac disease. The detection of high titers of Antigliadin antibody (AGA), anti – reticulin antibody (ARA) or anti – endomysium (EMA) antibody at the time of diagnosis, and the subsequent decrease in titers after removal of dietary gluten, and specificity to the histologic findings are important feature of this conditions. Although assays for ARA and, in particular, EMA are reported to be more specific than those for AGA in screening for celiac disease, they are technically more demanding and far more expensive. Moreover, EMAs are uniquely of IgA isotype and thus will inevitably lead to false – negative results in celiac patients with selective IgA deficiency, a frequent association. In addition to its low cost, the AGA assay can be performed easily in any serology laboratory, and the quantitative results provided allow for the comparison of serial measurements. (3)

Prevalence of the disease:- Recent estimates of the prevalence of a wider spectrum of gluten sensitivity with often less florid but more diverse symptomatology – gut dysfunction (both diarrhea and constipation), abdominal bloating, dyspepsia, mouth ulceration, mood changes, arthritis, general fatigue, mild anemia – are in the 1 in 100 – 300 range. There are major national differences in

prevalence. However screening of populations with Downs Syndrome has revealed much higher prevalence (from 4 – 17 %) depending on age of samples and country of origin (5).

Authors	N	Age Yrs	Prevalence
Zubillaga et al 1993 - Spain	70	1 – 14 yrs	4.3 %
Jansson & Johansson – 1995 - Sweden	65	< 18 yrs	16.9 %
George et al 2000 Netherlands	115	5.8 ± 3.8 yrs	7.0 %
Csizmadia et al 2000 Netherlands	137	1 – 23 yrs	8.0 %
Carlsson et al 1996 Finland	45	Ch - Adolescen ts	17.7 %
Pueschel et al 1999 USA	105	2 – 28 yrs	4 – 5 %

Many normal people with Down's syndrome have features commonly associated with gluten intolerance / sensitivity. In childhood, muscle hypotonia predisposes to potbelly. Disordered bowel function is a common feature of Down's syndrome. General lethargy and fatigability are not unusual, and the arthritis occurs more than general population. For these reasons clinical diagnosis of Coeliac disease is likely to be difficult. Therefore many authors recommend that all people with Down's Syndrome should be screened for coeliac disease (George et al 1996, Pueschel et al 1999, Ciszadia et al 2000)(6,7). Antigliadin antibodies are present in over 50 % of children with Down's syndrome (6). Therefore it is recommended that these patients should receive either Anti Endomyseal Antibody (90 % sensitivity and 98 % specificity) or Tissue Tans – glutaminase IgA antibodies (90 % sensitivity and 96 % specificity). (5) Due to high cost the Anti – endomyseal antibodies are used sparingly. We are using Anti tissue Trans – glutamines IgA antibodies as a screening test.

Gluten Sensitivity Screening in Children with Down's syndrome.

*Anil B. Jalan **, *Judith Vaz ***, *Chandralata Sharma****

NIRMAN, 203, Nirman Vyapar Kendra, Sector 17, Vashi – Navi-Mumbai, India.

* Chief Scientific Research Officer (Bio – chemical Genetics)

** Chief Neuro – developmental Physiotherapist

*** Speech Therapist And Audiologist

Method:- We screened 13 children with Down's syndrome attending our center for Neuro – developmental physiotherapy and Speech Therapy. We selected children above 6 months of age where gluten was introduced in the form of Wheat. Venous blood was collected. Antigliadin Antibodies Ig G, Ig A, & Tissue Transglutaminase IgA estimated by ELISA method using kits by Genesis Diagnostic (UK).

Results:- 7 out of 13 children (53.84 %) with Down's syndrome had all three positive. 3 children (23.08 %) had two titers positive and 3 children(23.08 %) had one titer positive. None of the Down syndrome children showed all three parameters normal. All 7 children who showed 3 parameters positive were advised Gluten free diet. However only 5 children accepted GFD. All these children were followed – up for next 6 months in the OPD. The development of milestones and speech improved was much faster in the children treated with GFD, as compared to other children with Down syndrome. This was subjective assessment of the Neuro – developmental Physiotherapists and Speech therapists. It was difficult to quantify the clinical improvement there fore no statistical data can be generated.

Table No. 1 :-

No	Down's syn	Age	Sex	AGA Ig G	AGA Ig A	T Ig A
1	C.P.	1 Yr	F	23.69	6.67	4.46
2	K.A.	2.5 Yr	M	227.06	24.35	21.34
3	N.M	14 M	F	192.65	12.33	7.24
4	K.A.	1.5 Yr	M	75.848	6.593	31.634
5	J.G.	5 Yrs	M	58.295	6.897	80.497
6	C.J.	19 Yrs	M	591.06	14.38	469.41
7	D.D.	3 Yrs	M	21.144	6.277	5.448
8	S.S.	2 Yrs	F	51.954	1.927	13.394
9	K.G.	6 Yrs	F	30.462	0.794	3.204
10	A.K.	2.5 Yrs	M	37.43	1.54	4.98
11	N.S.	2 Yrs	F	147.25	17.49	19.92
12	J.D.	8 M	M	30.037	1.522	5.185
13	S.K.	4 Yrs	M	88.86	15.83	40.11

Table 2 :-

No		Impression	Result n = 13	%
1	All 3 parameters normal	Negative Results	0 / 13	0 %
2	Only 1 parameter s positive	Probably negative	3 / 13	23.8 %
3	Only 2 parameter s positive	Probably positive	3 / 13	23.08 %
4	All 3 parameter s positive	Positive	7 / 13	53.84 %

Conclusion :- There is definitely a higher incidence of Gluten sensitivity in the children with Down's syndrome (> 50 %). Gluten sensitivity screening should be performed for all such children and if child shows all 3 parameters positive gluten free diet option should be offered. Jejunal biopsies or Anti Endomyseal antibodies are recommended in screen positive patients. Acceptance of GFD is dependant upon the family background and eagerness to treat Down syndrome children an therefore it is always better to counsel parents before performing the test about possible GFD option for their children. It is our personal experience that Down syndrome children who comply with GFD show much faster gain in milestones an speech language.

It should never be assumed that because a person has Down's syndrome, investigations for the presence of Coeliac disease is unnecessary. Quality of life can be much improved on a gluten free diet. Nor should it be assumed that compliance with a gluten free diet would be impossible. On the contrary there is anecdotal evidence that because of the generally higher level of supervision compliance may be more readily achieved than in the general population. If carefully taught with regard to compliance issues, most of those with Down's syndrome will tackle the necessary dietary restrictions in a responsible manner (5).

Gluten Sensitivity Screening in Children with Down's syndrome.

*Anil B. Jalan **, *Judith Vaz ***, *Chandralata Sharma****

NIRMAN, 203, Nirman Vyapar Kendra, Sector 17, Vashi – Navi-Mumbai, India.

* Chief Scientific Research Officer (Bio – chemical Genetics)

** Chief Neuro – developmental Physiotherapist

*** Speech Therapist And Audiologist

Ref: -

1. Failla P. et al, Coeliac Disease in Down's syndrome with HLA serological an molecular studies, J Pediatr Gastroenterology Nutr. 1996, Oct; 23 (3) : 303 – 306
2. Castro. et al “ Down's Syndrome and Coeliac disease; the prevalence of high Ig A Antigliadin antibodies an HLA DR and DQ antigens in Trisomy 21” Peds Gastroenterology and Nutrition 16:265 268, 1993.
3. Lucie J. et al, Effectiveness of Antigliadin Antibodies as a screening Test for Coeliac Disease in Children, CMAJ, 1997: 157: 527 – 533.
4. S. Mohindra, S.K. Yaccha et. al., Coeliac Disease in Indian Children: Assessment of Clinical, Nutritional and Pathology characteristics, J. Health Popul. Nutr. 2001 Sept. 19 (3) 204 – 208.
5. Jennifer Dennis, Charlie Charlton, Down Syndrome Coeliac Disease / Gluten sensitivity, Coeliac clinical awareness not (11 / 11 / 01) : www.dsmig.org.uk
6. George EK et al, Mearin ML et. al., (1996), High frequency of celiac disease in Down's syndrome, J. Pediatrics.128,4. 555 – 557.
7. Pueschal SM, Romano C, et al. (1999), A prevalence study of celiac disease in persons with Down's syndrome residing in the United states of America. Acta Paediatrica. 88 953 – 956.