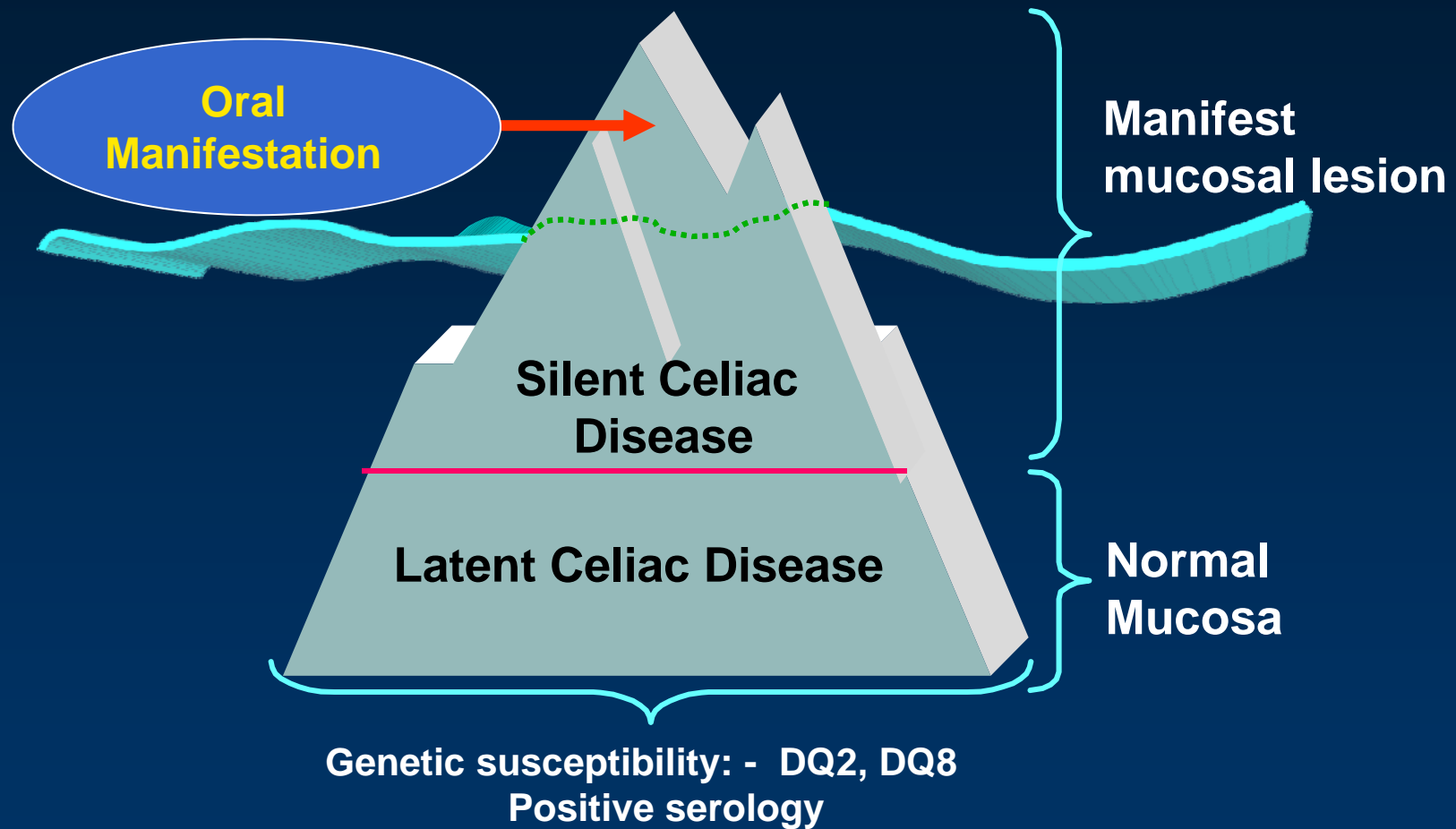


Oral Health Status and Salivary Properties in Relation to Gluten Free Diet in Children with Celiac Disease

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The Celiac Iceberg



Dental Enamel Defects



*Involve the secondary dentition
May be the only presenting sign of Celiac Disease*

Recurrent Aphthous Stomatitis



Oral Manifestation

- Dental carries
- Dental Age
- Atrophic glottitis
- Oral Lichen Planus
- Carcinoma of the tongue
- Oral T-cell lymphoma

- Better adherence to GFD reduces , the prevalence of caries*
- Lower prevalence of salivary Mutants Streptococci and Lactobacilli colonization**

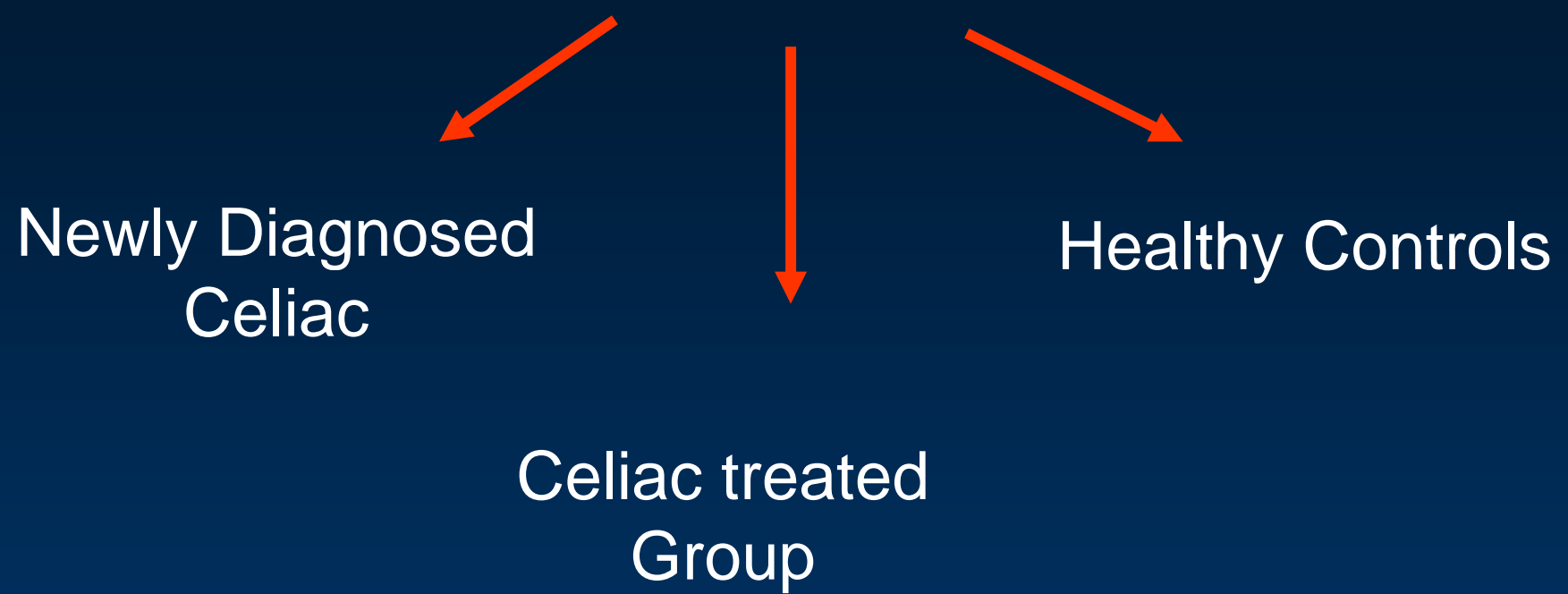
**Turk J Pediatr 2008;50:45-50*

***Med Princ Pract 2012;21:129-33.*

Aim

- To study children with Celiac disease
 - Oral health
 - Bacterial colonization
 - Salivary buffering capacity

Groups



```
graph TD; Groups[Groups] --> NewlyDiagnosedCeliac[Newly Diagnosed Celiac]; Groups --> CeliacTreatedGroup[Celiac treated Group]; Groups --> HealthyControls[Healthy Controls];
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Newly Diagnosed
Celiac

Celiac treated
Group

Healthy Controls

Methods

- Interviews and questionnaires.
- Two blinded specialized pediatric dentists.
- Evaluation of
 - dental caries
 - grading of enamel defects
 - charting of plaque index.

DMFT & Plaque Index

- Decayed (D); Missing (M); Filled (F) teeth in the dentition= DMFT
- Illustrate the amount of the dentition that has become affected by dental caries.
- Plaque Index is used to evaluate the thickness of plaque at the gingival margin of the teeth.
 - score from 0-3; 0-means no plaque & 3 means abundance of soft debris.
 - Plaque index is the total score divided by the number of teeth

Enamel Defect

Classification	Enamel defect
Grade 0	No defect
Grade I	Defect in enamel color.
Grade II	Slight structural defects.
Grade III	Evident structural defects.
Grade IV	Severe structural defects.

Salivary sampling

- Saliva analysis- standard bioassay and plating procedures on a Caries Risk Test (CRT) (CRT; Ivoclar Vivadent Inc)
- The CRT kits were incubated at 37°C for 48 hours.
- Mutans Streptococci (MS) and Lactobacilli (LB) count
- Salivary buffer capacity was detected using pH indicators from CRT and was evaluated using a color scale provided by the manufacture.

Salivary sampling

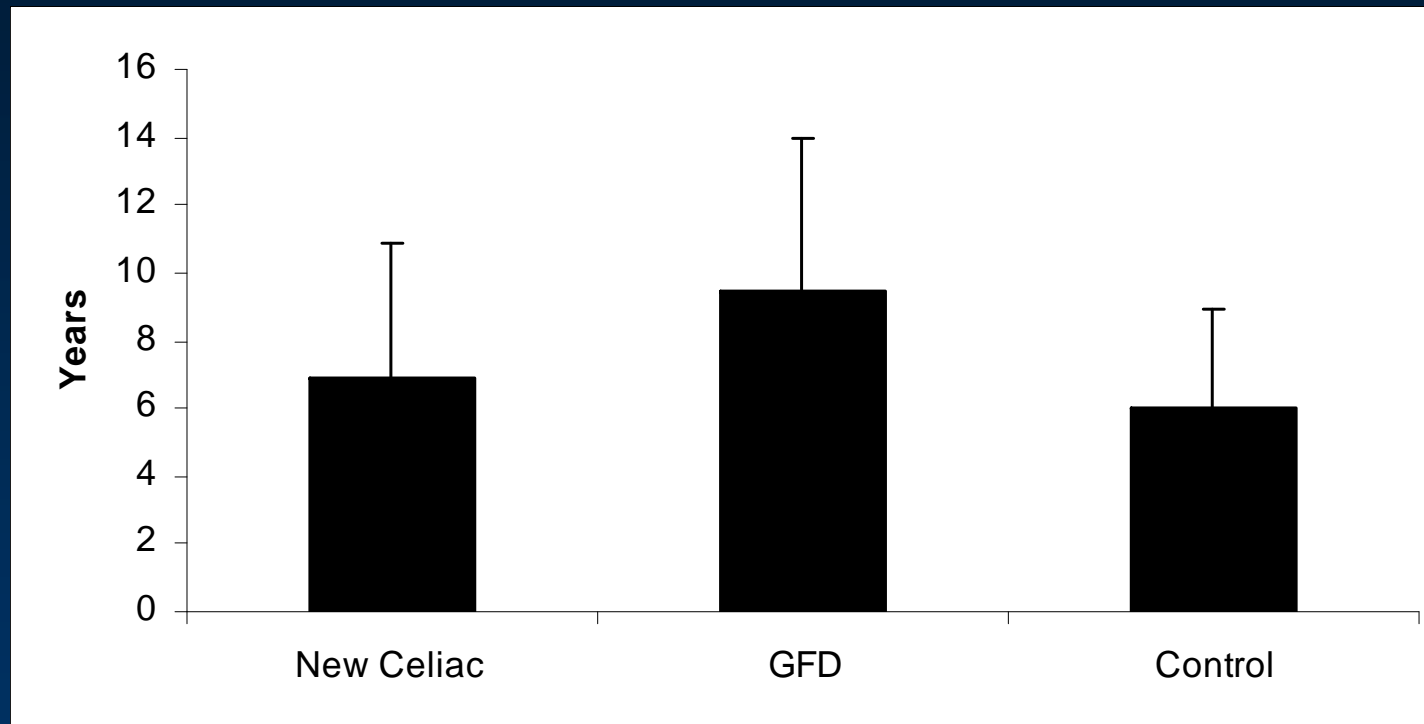
- *Oral mucosal pH-* assessed using pH level indicator test strip (pH indicator strips, Mark, KGaA, Darmstadt, Germany).

Oral health behavior

- Questionnaire
 - In-between meals snacks
 - Main beverage consumed during the day
 - Tooth brushing habits
 - Use of fluoride containing toothpastes.
- The dietary habits-most predictive of caries risk in a clinical settings in the United States

Results

Age

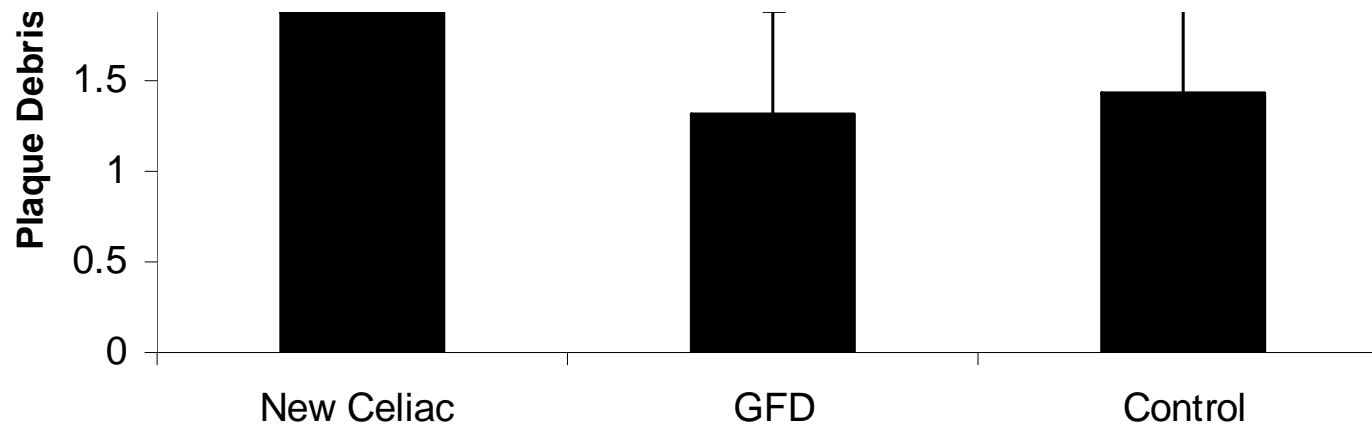


One-way ANOVA $df=2$; $F=6.755$; $p=.002$

Results

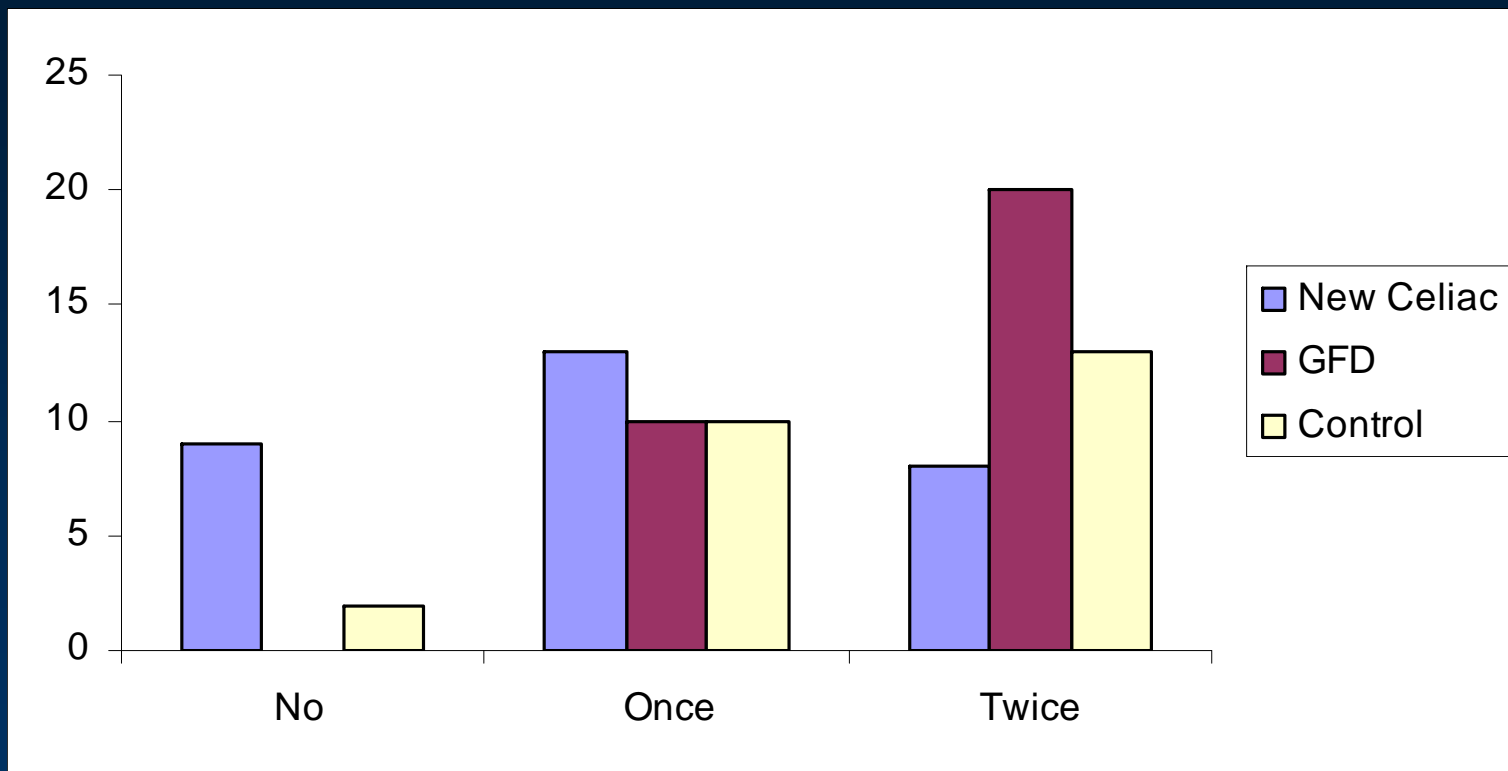
Plaque Debris Index

A correlation between plaque index and oral health behavior, especially with the frequency between meals snacks consumption
(Chi-square, $df=2$; $P=0.009$)



One-way ANOVA $df=2$ $F=6.75$ $p=0.02$

Teeth Brushing



Fisher's Exact Test $P=0.001$

Results

- No differences in enamel defects
 - 66% of all groups
 - As reported in celiac but higher than in the healthy population

Enamel Defects



Results

- No differences in enamel defects
- No difference in oral mucosal pH
- No differences were found between the groups regarding the LB and MS counts
- Correlation was found between DMFT/dmft and LB counts (Chi-square, $df=4$; $p=0.026$)

Summary

- A lower degree of plaque was found in celiac children on GFD.
- This finding could not be explained by salivary properties or bacteria
- better oral hygiene correlated with low plaque in children with GFD
- This suggests that children with treated celiac disease are more aware of health related issues.

Summary

- Children with celiac should be referred to dentist upon diagnosis

What Next?

- Studying enamel defect in Israeli children
- The effects of GFD on the family
- Searching for salivary protein markers of diagnosis of celiac disease