INTESTINAL MICROBIOTA ANALYSIS SUPPORTS INCLUSION OF GLUTEN-FREE OATS TO DIET OF SUBJECTS WITH CELIAC DISEASE OR GLUTEN SENSITIVITY

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BACKGROUND

Gluten-free diet (GFD) may lead to restricted and nutritionally suboptimal diet and microbiota dysbiosis since many gluten-free products have high fat but low fiber content. Previously, the majority of the studies analyzing the fecal microbiota of subjects with celiac disease (CeD) have been conducted with pediatric patients or by using conventional methods with limited throughput. In addition, the microbiota signatures of NCGS subjects has not been characterized so far.
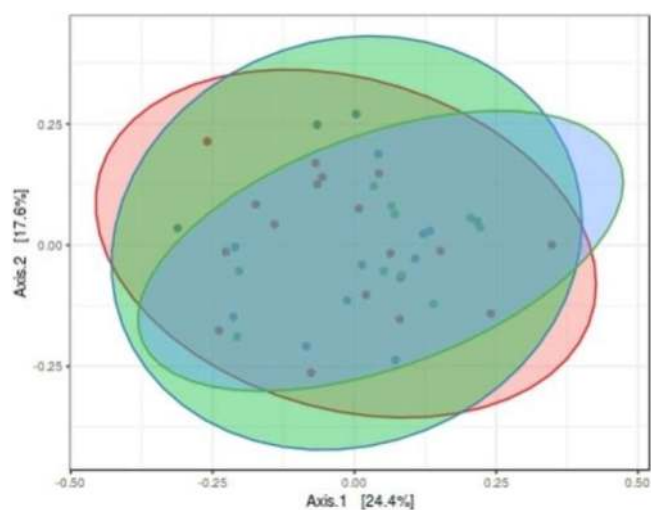

Fig. 1. Total microbiota profiles of study subjects were comparable between the groups as assessed by Principal Component Analysis (PCoA). Celiac disease (red), Gluten sensitivity (blue) and healthy controls (green).

AIM

The aim of this study was to evaluate the effect of daily consumption of oat products on intestinal microbiota composition and activity in subjects with gluten-related disorders.

METHODS

Subjects with CeD (n=19) or NCGS (n=10) and healthy volunteers (n=14) were recruited to the study. Study subjects completed gut symptom diaries for 30d and food diaries for 4d preceding fecal sample collection. Intestinal microbiota composition was characterized using 16S MiSeq sequencing.

Table 1. Dietary data is presented as an average of 4d intake based on food diaries. Values are mean (SD), unless otherwise stated.

GROUP	CeD	NCGS	CTRL	p-value
Subjects (n)	19	10	14	n.s.
Male/Female[1]	4/15	1/9	6/9	n.s.
Age (y)[2]	51 (24, 65)[a]	34 (22, 61)[b]	34 (24, 63)[b]	0.020
BMI (kg/m^2)	24.6 (3.2)	23.0 (2.6)	24.4 (2.6)	n.s.
Proteins (E %)	17.1 (3.6)	16.5 (3.4)	15.8 (3.1)	n.s.
Carbohydrates (E %)	**41.9 (4.9)[ab]**	**40.3 (6.1)[a]**	**45.8 (4.8)[b]**	**0.045**
Fat (E %)	**36.4 (5.7)[ab]**	**41.0 (6.2)[a]**	**34.7 (4.6)[b]**	**0.025**
Dietary fiber (g)	**25.5 (9.1)**	**27.6 (7.7)**	**26.0 (7.4)**	**n.s.**
Diet Quality Index	10.9 (1.7)	10.2 (2.2)	10.3 (1.5)	n.s.

CeD subjects with celiac disease, NCGS non-celiac gluten sensitivity, CTRL healthy controls
1Pearson Chi-Square. Others One-way ANOVA.
2median (min, max)
Values with different letters differ from one another in each row.

CONCLUSION

To conclude, microbiota markers demonstrated that oat consumption was safe and beneficial for subjects with CeD or NCGS. Oat consumption was shown to enrich available gluten-free diets and to increase dietary fiber intake to the recommended levels.

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