

The effect of fructooligosaccharide (FOS) in children with diarrhea

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ABSTRACT

Mohammad Juffrie, Yunri Istari, Nenny Sri Mulyani, Yati Soenarto - *The effect of fructooligosaccharide (FOS) in children with diarrhea.*

Background: Diarrheal disease is still the most important cause of children morbidity and mortality in developing countries. This diarrhea is caused by the balance of intestinal flora which is influenced by the number of friendly bacteria. FOS may stimulate the growth of friendly bacteria and inhibit pathogen bacteria causing intestinal infection.

Objective: To know the effect of fructooligosaccharide in diarrheal disease

Method: A randomized control trial was conducted in 8 health centres, Yogyakarta. One hundred and eighteen samples were included in this study. Ninety three samples in FOS group received FOS 2.5 gram or 5 gram/day depend on age for 3 weeks and 25 samples in placebo group. The duration of diarrhea, acidity of stool were recorded during the study.

Results: The duration of diarrhea was significantly shorter in the FOS group compared to placebo, $p < 0.001$. Stool in FOS group is more acid compared to placebo after intervention

The color of stool in the FOS group changed into yellowish compared to the placebo. There was no significant difference on the number of leucocytes between the FOS and the placebo group.

Conclusion: Administration of FOS in children with acute diarrhea has an effect on the duration of diarrhea. FOS changed the stool's acidity.

Key words: diarrhea, intestinal flora, friendly bacteria, fructooligosaccharide effect

ABSTRAK

Mohammad Juffrie, Yunri Istari, Nenny Sri Mulyani, Yati Soenarto - *Efek fruktooligosaccharid (FOS) pada anak dengan diare.*

Latar belakang: Penyakit diare masih merupakan penyebab penting kesakitan dan kematian bayi dan anak di negara berkembang. Penyakit diare ini disebabkan oleh ketidakseimbangan flora usus yang dipengaruhi oleh jumlah bakteri yang menguntungkan. FOS dapat menstimulasi pertumbuhan bakteri yang menguntungkan dan menghambat bakteri patogen yang menyebabkan infeksi saluran cerna

Tujuan: Mengetahui efek Fructooligosaccharide pada diare

Bahan dan cara: Penelitian kendali acak dilakukan di 8 puskesmas di Yogyakarta. Seratus delapan belas sampel ikut dalam penelitian ini, 93 masuk dalam kelompok FOS yang mendapat FOS 2,5 gram atau 5 gram per hari sesuai umur, dan 25 masuk dalam kelompok plasebo. Lamanya diare dan keasaman tinja diukur selama penelitian.

Hasil: Lama diare lebih pendek secara bermakna pada kelompok FOS dibanding plasebo $p < 0,001$. Tinja pada kelompok FOS lebih asam dibanding plasebo setelah intervensi. Warna tinja pada kelompok FOS berubah ke lebih kuning terang dibanding plasebo, sedangkan leukosit tinja tidak ada perbedaan antara FOS dan plasebo

Simpulan: Pemberian FOS pada anak dengan diare akut mempunyai efek pada lamanya diare. FOS mengubah keasaman tinja.

before, during and after the intervention. The number of blood leucocytes was counted using lugol staining method.

Data were analyzed using SPSS 12th version statistical computer program. Data in mean were analyzed using Student t-test; data in proportion were analyzed using chi-square test.

RESULTS

One hundred and eighteen patients were involved in this study. Ninety three were included in the FOS group and 25 in the placebo group. Mean age was higher in the FOS group compared to that of placebo group (TABLE 1). The duration of diarrhea was significantly shorter in the FOS group compared to the placebo, $p < 0.0001$ (TABLE 2, FIGURE 1). The duration of diarrhea in the FOS

group for specific age was significantly shorter as well compared to the placebo group, $p < 0.01$ (TABLE 3, FIGURE 2).

The frequency of diarrhea on admission was similar between the FOS group and the placebo (TABLE 4, FIGURE 3). Side effect prolong diarrhea only found in placebo group. The stool in the placebo group was more acid compared to the FOS group on admission. During the intervention, acidity of stool was similar between the FOS and the placebo group. However, after the intervention the stool of FOS group became more acid (TABLE 5, FIGURE 4) The color of the stool in the FOS group was mostly changed into yellowish compared to the placebo group (TABLE 6.). There was no significant difference in the number of leucocytes between the FOS group and the placebo group (TABLE 7).

TABLE 1. Age of sample

	n	Mean of age (year)	Standard of deviation	P value
FOS	93	5.44	3.76	0.058
Placebo	25	3.31	2.99	

TABLE 2. Duration of diarrhea (day)

	N	Mean of day	Standard of deviation	P value	95% CI lower	95% CI upper
FOS	93	2.62	0.97	0.001	- 2.11	- 1.12
Placebo	25	4.24	1.54		- 2.28	- 0.96

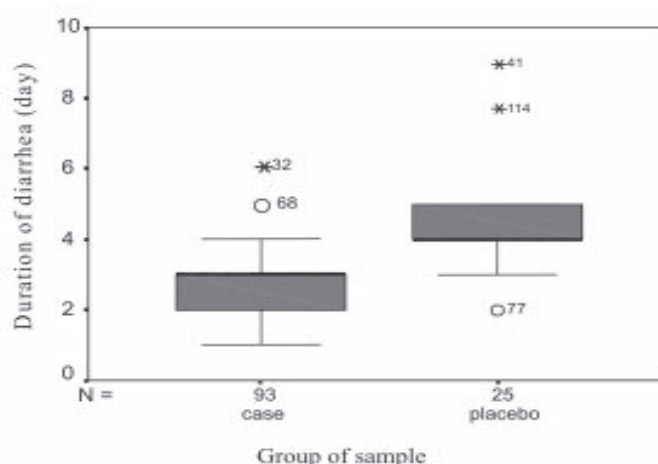


FIGURE 1. Duration of diarrhea

TABLE 5. pH of stool before, during and after administration of FOS

		N	Mean	Standard of deviation	P value	95% CI lower	95% CI upper
Before	FOS	93	6.5	0.8	0.001	0.42	1.19
	Placebo	25	5.7	1.0		0.34	1.27
During	FOS	93	5.9	0.6	0.6	- 0.38	0.26
	Placebo	25	6.0	0.5		- 0.37	0.24
After	FOS	93	5.6	0.6	0.006	- 0.78	- 0.13
	Placebo	25	6.0	0.7		- 0.80	- 0.11

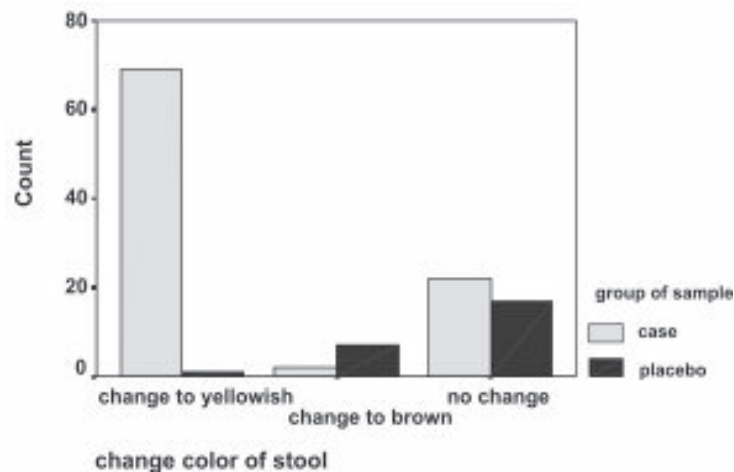


FIGURE 4. Changed color of stool

TABLE 6. Changed color of stool

Changed of color	FOS (%)	Placebo (%)	Total (%)
To yellowish	69 (74.2)	1 (4)	70 (60.2)
To brown and dark	2 (2.2)	7 (28)	9 (9.3)
No changed	22 (23.7)	17 (68)	39 (33.1)

TABLE 7. Number of leucocytes, before, during and after administration of FOS

		N	Mean	Standard of deviation	P value	95% CI lower	95% CI upper
Before	FOS	93	11.5	24.6	0.9	- 10.4	11.0
	Placebo	25	11.2	21.4		- 9.8	10.4
During	FOS	93	4.3	12.6	0.7	- 4.8	7.0
	Placebo	25	4,2	3.0		- 2.4	4.5
After	FOS	93	2.2	1.0	0.5	- 0.6	0.3
	Placebo	25	2.3	0.7		- 0.5	0.2

DISCUSSION

This study aim was to know the effect of FOS on children with acute diarrhea. It was demonstrated that the duration of the diarrhea in

children who ingested FOS was shorter than in the placebo. This data indicated that the ingestion of FOS influenced the duration of the diarrhea in children with acute diarrhea.

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