Fructooligosaccharide ameliorates estrogen-gut-microbiome-brain axis dysfunction in estrogen-deficient rats

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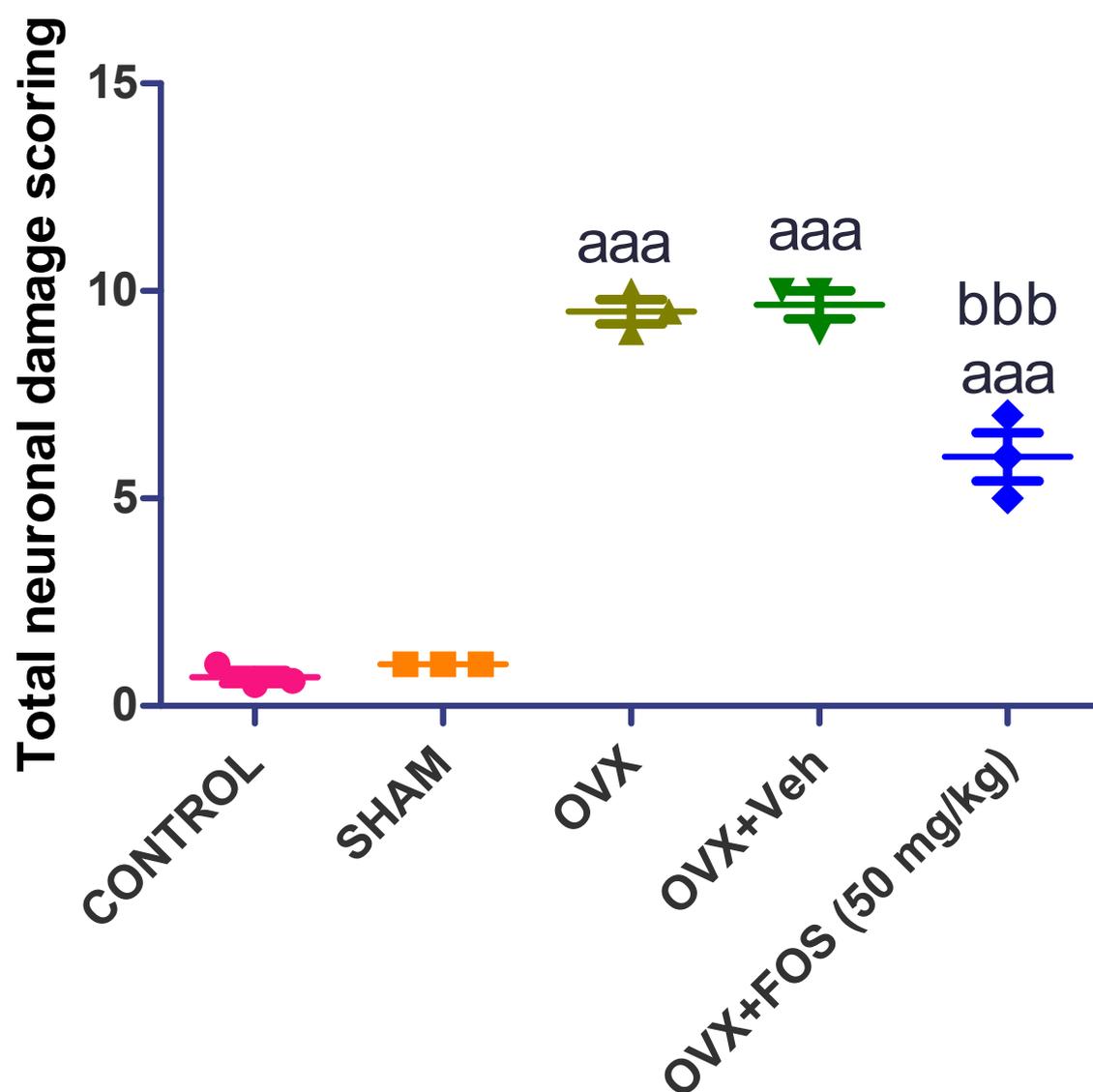

Fig. 1: Hippocampus damage scoring was calculated between control, sham, OVX, OVX+Veh, and OVX+FOS (50 mg/kg) groups. The neuronal damage score was calculated from 10 images acquired from different hippocampal regions of each rat (n = 3). All experimental groups were compared to the control group (a) and to the OVX group (b), as indicated: (aaa) $p < 0.001$ vs Control; (bbb) $p < 0.001$ vs OVX.
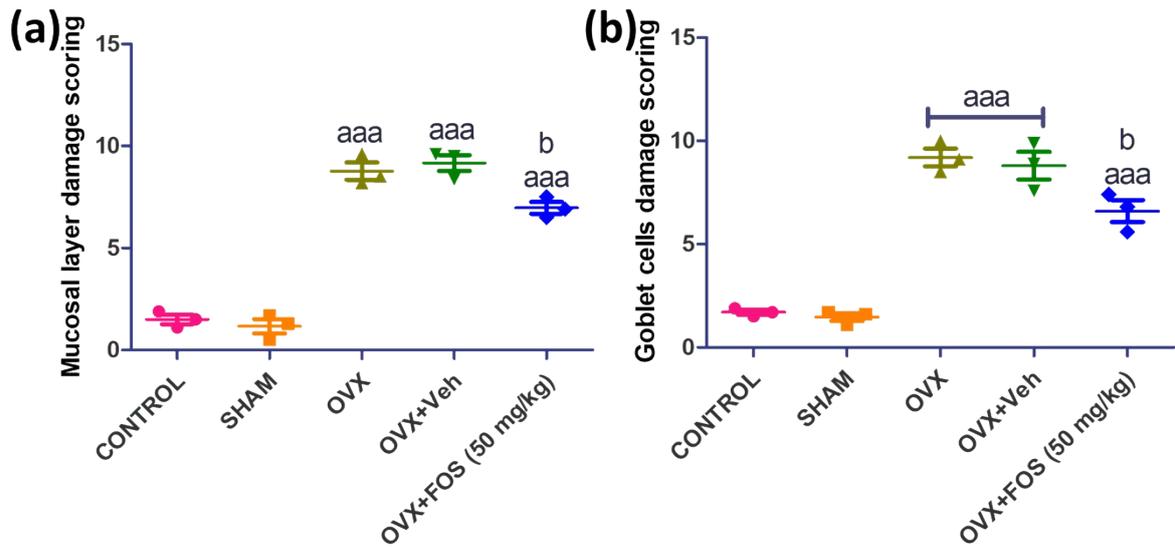
Fig. 2: Proximal colon damage scoring in control, sham, OVX, OVX+Veh, and OVX+FOS (50 mg/kg) groups. (a) Mucosal layer damage scoring; (b) Goblet cell damage scoring. For each rat (n = 3), a total of 10 images from different colon regions were analyzed to calculate the histological damage score. All experimental groups were compared to the control group (a) and to the OVX group (b), as indicated: [aaa] $p < 0.001$ vs Control; [b] $p < 0.05$ vs OVX.
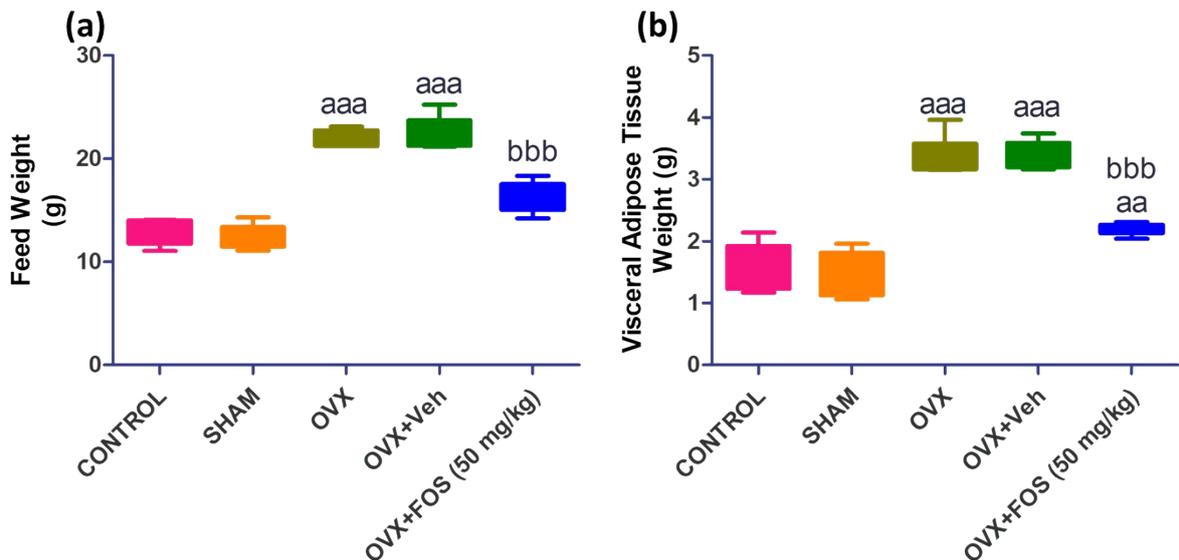

Figure 3: Effect of FOS on feed weight and visceral adipose tissue in OVX rats. (a): Feed weight (n=6); (b): Visceral adipose tissue weight (n=6). All experimental groups were compared to the control group (a) and to the OVX group (b), as indicated: [aa] $p < 0.01$ vs Control; [aaa] $p < 0.001$ vs Control; [bbb] $p < 0.001$ vs OVX.

Table 1: Forward and reverse primer sequences used for RT-PCR quantification of gene expression in proximal colon and hippocampus

Genes	Forward (5'-3')	Reverse (5'-3')
ERβ	GCAGAACCTCAAAAGAGTCCTTGG	ACGCCGTAATGATACCCAGATG
ERα	GCCTTCTACAGGTCCAATTCTGAC	ACAGCACAGTAGCGAGTCTCC
CRH	GAATACTTCCTCCGCCTGGG	GGAAAAAGTTAGCCGCAGCC
MAO-A	ACTGCTCGGGAATTTGCGTA	CAAATTTCCGTTCCTGGCCG
COMT	TGTTAAAACCCGTGTCTGCG	ATCAGGTTGTGGACTGGCTG
Bax	CACTAAAGTGCCCGAGCTGA	AAGCCTCTTGAGACCCTCAC
BCL-2	CTGGTGGACAACATCGCTCT	GCATGCTGGGGCCATATAGT
TLR-4	TGGCAGTTTCTGAGTAGCCG	GCTTTTCCATCCAACAGGGC
Claudin	TGTCCACCATTGGCATGAAG	GCCACTAATGTCGCCAGACC
MUC-2	GCCAGATCCCGAAACCATGT	AGGACGGACTCTATGCTGGA
IL-6	TCCTACCCCAACTTCCAATGCTC	TTGGATGGTCTTGGTCCTTAGCC
TNF-α	GTCGTAGCAAACCACCAAGC	TGTGGGTGAGGAGCACATAG
Lipocalin-2	GGACCAGGGCTGTCGCTACT	GGTGGCCACTTGCACATTGT
GUSB	CCTTTCTACTTCCAAGGCGTCA	CAACGGAGGAGGTTGAAATCC
GR	CTCAGTAAGCAATGCGCAGC	ACACTGATCTTACCTTGAATAGCC
MR	GATTCCAGGTCGTGAAGTGGG	AGAGGAGTTGGCTGTTCGTG
β-actin	GGACTTCGAGCAAGAGATGG	AGCACTGTGTTGGCGTACAG