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TITLE

Diabetes and Intestinal Mucosal Homeostasis

Sukhotnik I

Rappaport Faculty of Medicine, Technion
- Israel Institute of Technology, Dept of
Pediatric Surgery, Bnai Zion Medical Center
Haifa, Israel

Aims/hypothesis: This study was conducted to evaluate the intestinal response to the induction of diabetes and to oral insulin administration in a rat model of diabetes.

Methods: Male Sprague-Dawley rats were divided into four experimental groups: Control rats, CONTR-INS rats who were treated with OI given in drinking water for 7 days, diabetic rats who were injected with one dose of streptozotocin (STZ), and diabetic rats treated with OI. Intestinal structural changes, enterocyte proliferation and enterocyte apoptosis, bax and bcl-2 mRNA and protein levels, insulin receptor expression and ERK protein levels were determined at sacrifice. A Kruskal Wallis test followed by a Post Hoc test for multiple comparisons was used for statistical analysis.

Results: Induction of diabetes resulted in a significant increase in bowel and mucosal weight, mucosal protein, villus height and crypt depth in jejunum and ileum, and mucosal DNA in ileum compared to control animals. Diabetes also enhances ERK-induced cell proliferation and concomitant bax/bcl-2 induced cell apoptosis. Treatment of diabetic rats with OI resulted in a significant decrease in jejunal protein content, jejunal and ileal villus height, and jejunal crypt depth, as well as an inhibition of ERK-related cell proliferation in ileum. Expression of insulin receptor was down-regulated following OI administration in both control and diabetic animals.

Conclusion: Experimental STZ-induced diabetes causes intestinal mucosal growth and enhances enterocyte turnover in a rat model. Oral insulin administration diminishes diabetes-accelerated cell turnover and diabetes-induced mucosal hyperplasia.

Biography

Sukhotnik Igor has completed his MD at 1985 from Chernovtsy Medicinal School, Ukraine and has completed his residency and fellowship in Pediatric Surgery and General Surgery at 1998 and 2003 in Israel. He is Senior Lecturer in Rappaport Faculty of Medicine, Technion - Israel Institute of Technology (Laboratory of Intestinal Adaptation and Recovery, Head) and Pediatric Surgeon at Dept of Pediatric Surgery, Bnai Zion Medical Center Haifa, Israel. He has published more than 86 papers in reputed journals and serving as an editorial board member of Open Journal of Gastroenterology.