Trakia Journal of Sciences, Vol. 12, Suppl. 1, pp 141-143, 2014

Available online at:
http://www.uni-sz.bg

ISSN 1313-7050 (print)
ISSN 1313-3551 (online)

CHARACTERISTICS OF GHRELINPOSITIVE CELLS OF THE STOMACH IN THE RAT

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ABSTRACT
Ghrelin is a novel hormone which is mainly produced by distinct endocrine cells in the fundus of stomach. The aim of this investigation is to discover ghrelinpositive endocrine cells in the stomach mucosa. We applied immunohistochemical methods and antibodies Ghrelin (H- 40) SC- 50 297, Company Santa Cruz, USA. We visualized results with detection system Daco - En Vision FLEX - Mini Kit. Grelinpositive cells were visualized in the depth of the mucosa of the stomach fundus, close to the border with ventricular lamina propria.

Key words: ghrelin, ghrelinpositive cells, stomach, stomach, fundus

INTRODUCTION

Ghrelin is a newly discovered hormone that most researchers associated with the metabolism and which is mainly produced by distinct endocrine cells in the fundus of stomach. Although many previous studies grelinproducing denied any cells in the rest of the gastrointestinal tract, in other experiments it was detected not only in the stomach but also in the intestine, testes, pancreas and in a very other places in- and outside the digestive system. From the time of its discovery ghrelin is subject to diverse study by scientists worldwide.

According to Wren et al. (2001) Ghrelin enhances appetite and increases food intake in humans, and the same year Cummings et al. (2001) study the role of plasma ghrelin level and its relation to the beginning of human nutrition. Date (2000) discloses that the newly hormone ghrelin was synthesized in (distinct) endocrine cells of the gastrointestinal tract of rats and humans. Sun et al (2007) determine the role of ghrelin on glucose homeostasis in humans.

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Ariyasu (2001), after several years of research points to the important role of the stomach as the main source of ghrelin circulating in the

bloodstream and grelin-like immunoreactive plasma levels in humans and Romero et al (2010) publicated that peptide mainly secreted by gastric mucosa and has been implicated in the regulation of eating behavior and weight balance.

Van der Lely et al (2004), after many years of research made biological, physiological, pathophysiological and pharmacological profile of ghrelin and Purnell et al (2003) studied the physiological interactions. According to them, this hormone is correlated with insulin levels and cholesterol levels in the blood.

PURPOSE AND OBJECTIVES

The purpose of this study is to establish the existence of grelinpositive cells in stomach and duodenum mucosa in the rat.

To accomplish this goal, we set the following tasks:

Collection and preparation of biological material for immunohistochemical study.

Impact on the taken material with ghrelin antibody (Ghrelin (H- 40) SC- 50 297, Company Santa Cruz, USA).

Display immunohistochemical reaction with Daco - En Vision FLEX - Mini Kit system.
Monitoring and documentation of results.

MATERIAL AND METHODS

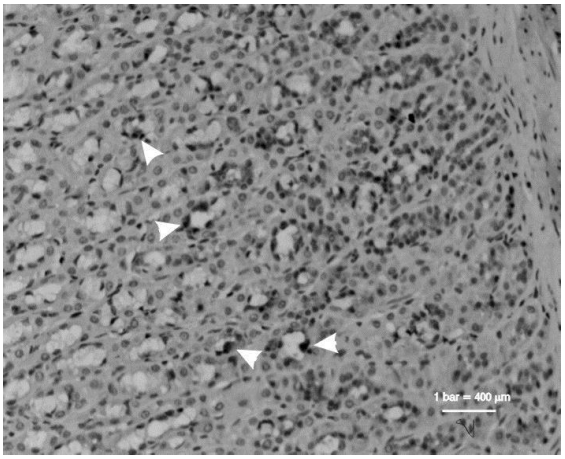
The biological material taken in vivo from the lining of the stomach lining from the bottom of the stomach in the rat race. Riyal is taken in compliance with all requirements for animal welfare according to the respective European directive and the permission of the Ethics Committee of the Medical Faculty, University of Thrace, Stara Zagora, Bulgaria.

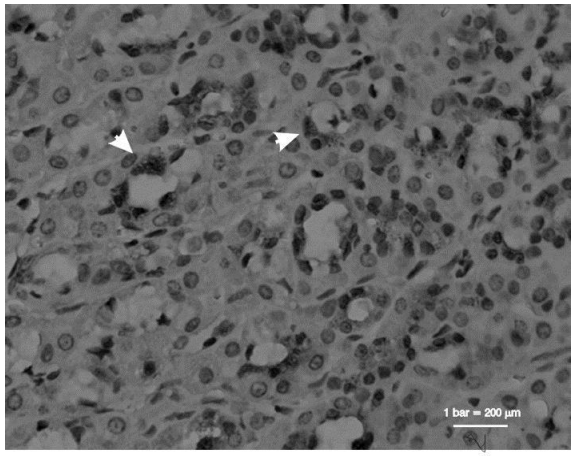
The material fixed in 10% aqueous formaldehyde for 48 hours, then embedded in paraffin in accordance with the requirements of 56^{o}C standard paraffin inclusion. Using ultramicrotome (Ultracut, Germany) did slice thickness 4 μm.

We applied immunohistochemical methods Ghrelin (H- 40) SC- 50 297 Company Santa Cruz, USA. Results visualized detection system Daco - En Vision FLEX - Mini Kit.

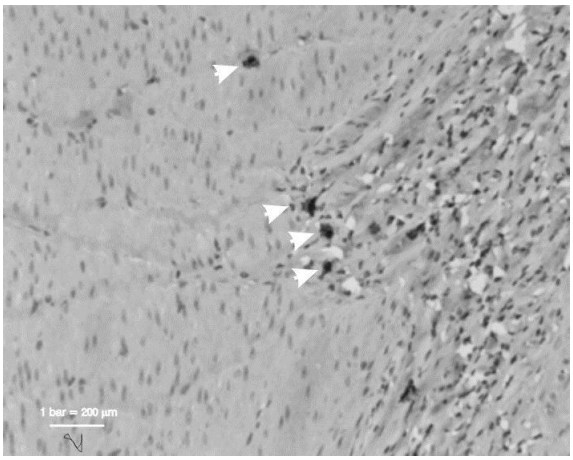
RESULTS

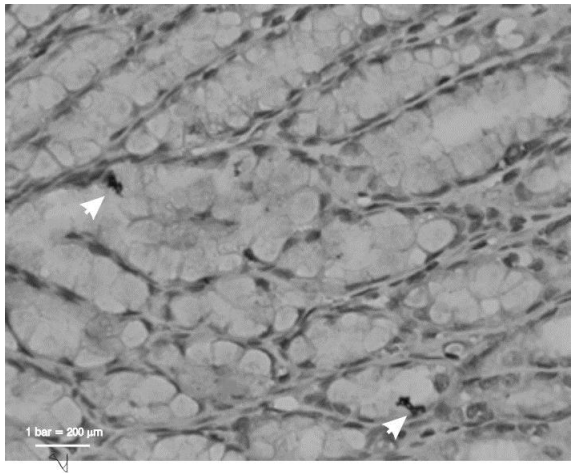
Grelinpositive cells were visualized in the depth of the mucosa of the fundus of the stomach, fundus ventriculi, close to the border with lamina propria of the mucosa. Individual cells containing granules with ghrelin are found in proximity to the muscle layer. The intensity of the color is different in different cells. Grelinpositive cells in the stomach mucosa are found in all investigated cases (**Figures 1-3,** magnification x200; **Figures 2-4,** magnification x400).





Figures 1-2. Grelinpositive cells in the depth of the stomach mucosa.





Figures 3-4. Grelinpositive cells in the depth of the stomach mucosa.

DISCUSSION

Ghrelin is a peptide mainly secreted by gastric mucosa and has been implicated in the regulation of eating behavior and weight balance (Maksud et al, 2011). Ghrelin is produced basic in distinct endocrine cells located within the gastric oxyntic mucosa. Our results are in accord of many publications (Broglio et al, 2001; Toshinai et al, 2001). Ghrelinpositive cells was found in deep layers of stomach mucosa. This is in accord with investigations of de la Cour et al (2001), Ariyasu et al (2001) and others. The density of ghrelin-immunoreactive cells in the stomach oxyntic mucosa was manifested.

CONCLUSION

In the digestive system is the availability of grelinpositive cells. The greatest amount of cells containing the ghrelin is detected in the mucosa of the stomach fundus. There are some ghrelin-immunoreactive cells near the muscular layer and rare – between muscle fibres.

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