Relationship between ghrelin and estrogen in the ovary of pregnant sheep

Sookhtehzari, A.¹, Alirezaei, M.²

¹Department of Clinical Sciences, School of Veterinary Medicine, Lorestan University, Khorramabad, Iran
²Division of Biochemistry, School of Veterinary Medicine, Lorestan University, Khorram Abad, Iran

Abstract:

BACKGROUND: Ghrelin, an endogenous ligand for the growth secretagogue receptor is predominantly produced in the stomach and an expression of ghrelin has recently been identified in placenta and ovary. OBJECTIVES: Therefore, we decided to measure ovarian ghrelin as quantitative and evaluate the correlation between ghrelin and estrogen during second half of ovine pregnancy. METHODS: The ovarian samples were collected from 40 pregnant sheep in 3, 3.5, 4, 4.5 and 5 months of pregnancy in a local abattoir. Follicles and active corpora lutea (CL) were dissected from surrounding tissues, separately. The samples were homogenized with phosphate buffer (0.1 M, pH=7.4) on liquid nitrogen to provide fluid samples. Ghrelin and estrogen concentrations were measured by ELISA method and expressed as milligram (mg) and picogram (pg) per mg of tissue protein, respectively. RESULTS: There was a linear correlation between ghrelin and estrogen in ovarian follicles (r=0.97 and p=0.004), but not in CL. Follicular ghrelin significantly increased in 4, 4.5 and 5 months (p<0.001) but CL ghrelin significantly decreased in the 4.5 month of ovine pregnancy (p<0.01). Estrogen concentration was also significantly higher in 4-5 months of pregnancy in ovarian follicles (p<0.001) but potent CL indicated higher estrogen level only in the 5th month of pregnancy (p<0.001). CONCLUSIONS: These results emphasize the role of ghrelin in the reproductive system and open a new window to future studies.

Key words: corpora lutea, estrogen, follicle, ghrelin, sheep

Introduction

In recent years, there has been increasingly more evidence to support the biological actions of ghrelin than those originally anticipated (Alirezaei et al., 2015; Du et al., 2010; Dupont et al., 2010; Du et al., 2009; Rak and Gregoraszczuk 2008; Caminos et al., 2003). Ghrelin has been identified as an endogenous ligand for growth hormone secretagogue receptor (GHSR) that regulates growth hormone (GH) secretion, regulates food intake, increases appetite and contributes to insulin release and energy homeostasis as well as acting as an antioxidant peptide (Alirezaei et al., 2015; Kheradmand et al. 2010, 2011; Neamati et al. 2011; Kojima and Kangawa 2005; Obay et al. 2008). Expression of ghrelin has been identified in an array of tissues and cell types including the stomach, small intestine, pancreas, lymphocytes, placenta, kidney, lung, pituitary and brain (Gualillo et al., 2003, Du et al., 2009).