Extensive changes in innate immune gene expression in obese Göttingen minipigs do not lead to changes in concentrations of circulating cytokines and acute phase proteins - DTU Orbit (10/11/2019)

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The usefulness of Göttingen minipigs as models for obesity and obesity-related pathologies is well established. The low-grade inflammation associated with obesity involves a range of innate immune factors; however, to our knowledge, the impact of obesity on innate immune factor expression has not been studied in Göttingen minipigs. Therefore, we studied the expression of innate immune genes in liver and adipose tissues as well as serum concentrations of cytokines and acute phase proteins in obese vs. lean Göttingen minipigs. In the liver, of 35 investigated genes, the expression of nine was significantly different in obese pigs (three up-regulated, six down-regulated). Of 33 genes in adipose tissues, obesity was associated with changed expression of 12 genes in the visceral adipose tissue (VAT) (three up-regulated), 11 in the abdominal retroperitoneal adipose tissue (RPAT) (seven of these up-regulated) and eight in the subcutaneous adipose tissue (SAT) from the neck (five of which were up-regulated). Obesity-associated expression changes were observed for three genes in all adipose tissues, namely chemokine (C-C motif) ligand 3-like 1 (up-regulated), CD200 molecule (down-regulated) and interleukin 1 receptor antagonist (up-regulated) with interleukin 1 receptor antagonist being the most highly regulated gene in both VAT and RPAT. Looking at patterns of expression across the three types of adipose tissues, obesity was associated with an increased number of acute phase proteins differentially expressed between adipose tissues and a decreased tissue-specific expression of cytokines and chemokines. In contrast to obese humans, no changes in serum concentrations of haptoglobin, C-reactive protein, serum amyloid A, tumor necrosis factor-α and interleukin 6 were found in obese Göttingen minipigs.

General information
Publication status: Published
Organisations: National Veterinary Institute, Section for Immunology and Vaccinology, Novo Nordisk A/S, University of Copenhagen
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Pages: 67–73
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Animal Genetics
Volume: 45
Issue number: 1
ISSN (Print): 0268-9146
Ratings:
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 2.12 SJR 0.934 SNIP 1.132
Web of Science (2014): Impact factor 2.207
Web of Science (2014): Indexed yes
Original language: English
Keywords: Comparative immunology, Immune responses, Inflammation, mRNA, Obesity, Pig model, Porcine models
DOIs: 10.1111/age.12090
Source: dtu
Source ID: u::9320
Research output: Contribution to journal › Journal article – Annual report year: 2014 › Research › peer-review