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LIVER INFLAMMATORY PATHWAYS ARE ASSOCIATED WITH SWINE INFLAMMATION AND NECROSIS SYNDROME (SINS) IN PIGLETS

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Introduction

Swine Inflammation and Necrosis Syndrome (SINS) has been hypothesized as a systemic process of inflammation, originating from the gut and liver and involving peripheral organs like tails, ears, coronary bands, soles, heels and claws with inflammation and necrosis. The syndrome can be seen as early as in suckling piglets, even directly after birth. Aim of the present study was to provide associations between inflammation of peripheral organs (SINS) and the pro-inflammatory and inflammatory metabolism of the liver.

Material and Methods

Fifty-three three days old suckling piglets and 47 39 days old weaners were scored for the degree of inflammation and necrosis of tails, ears, coronary bands, soles, heels and claws. Liver samples were taken directly after euthanasia, snap-frozen in liquid nitrogen and stored at -80°C until RNA extraction. The samples were examined with quantitative real-time PCR (qPCR) for expression of genes encoding for fibroblast growth factor-21 (FGF-21), haptoglobin (HP), intercellular adhesion molecule-1 (ICAM-1), interleukin-6 (IL6), superoxide dismutase-1 (SOD-1), tumor necrosis factor (TNF) and interleukin-8. Six piglets with least and 6 with most severe SINS symptomatic were selected for genome-wide transcriptomics, respectively.

Results

Inflammation and necrosis of the different body parts were significantly associated with each other and with key regulators of liver inflammation and metabolism. High correlations were detected e.g. between tail and ear inflammation/necrosis and liver haptoglobin expression in weaners ($r=0.5$; $p<0.001$). Numerous further associations were found in suckling pigs and weaners.

Discussion & Conclusions

Our results show a clear association between inflammation and necrosis of tail, ears, teats and claws (SINS) and liver metabolism. The link lies in significant changes of the expression of hepatic key regulators of inflammation and metabolism. Thus, the ongoing study provides a deep insight into the pathogenesis of the syndrome.