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The prenatal period can shape adult phenotype. Appetite is governed by the melanocortin system and regulated by neuroendocrine mechanisms that are vulnerable to stress. By investigating the neurobiological mechanisms of early life stress programming on hypothalamic feeding circuits we aimed to determine appetite development in birds and the impact of pre-natal stress. We investigated how changes in nutritional status, food availability, and early life stress programming effect the hypothalamic appetite pathways in Japanese quail (Coturnix japonica). Nine-day old female and male chicks (19L:5D), were randomly assigned to FED (control, ad libitum feeding) or FASTED (food removed at lights off and 4h fast from lights on) and FED CORT (ad libitum feeding, in ovo corticosterone injection at incubation day 5) groups. FASTED chicks had lower body and gut weights and lower blood glucose compared to FED control or FED CORT; no sex differences were observed. Behavioural analysis of video recordings showed that FED, FED CORT and FASTED chicks rested and rarely fed or drank during darkness. Following lights on, all chicks exhibited foodseeking behaviour (increased visits to feeding station during the first 2h of lights on), with more food seeking behaviour in FASTED chicks compared to FED and FED CORT chicks. RT-qPCR showed increased hypothalamic neuropeptide-Y (NPY) mRNA expression in FASTED compared to FED and FED CORT chicks. There were no differences in agouti-related peptide (AgRP), or proopiomelanocortin (POMC) and no differences in NPY, AgRP and POMC mRNA between FED control and FED CORT groups. These findings suggest that there are some functional differences in the neuropeptide mechanisms regulating food intake in young birds compared to adults and that early life stress does not alter feeding related neuropeptides in young quail. All work was performed under UK Home Office licence, ARRIVE guidelines and ethical review. Research supported by BBSRC (BB/5015760/1).
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