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| **ISA ISPID  Abstract Submission  Nº: 184**   |  | | --- | | Topics: **SIDS/SUID** | | Type: **Oral** | | **Pituitary Adenylate Cyclase Activating Polypeptide and its receptor in the Sudden Infant Death Syndrome brainstem medulla and pons** | | **Huang , Jessica**1; **Waters , Karen**1; **Machaalani , Rita**1 *1 - Sydney University .* | | **Introduction** Pituitary Adenylate Cyclase Activating Polypeptide (PACAP) is a highly conserved neuropeptide that plays a role in respiration, thermoregulation and neuroprotection. The selective receptor to PACAP is pituitary adenylate cyclase activating polypeptide type 1 receptor (PAC1). Based on knock out (KO) mice, PACAP KO mice have increased susceptibility to death around 2 weeks of age, as well as a higher risk of death due to thermal stresses, and a decline in chemoresponsiveness.  Similarly, PAC1 KO mice had an increase in death around 2 weeks from heart failure due to an increase in pulmonary arterial pressure. Given the prominence of PACAP in the role of respiration, our study will focus on the expression of PACAP and PAC1 in the brainstem, an area of high importance in respiratory control. Although the presence of PACAP and PAC1 has been studied in the rodent brainstem, its expression in the human infant brainstem has not yet been studied. Nor whether it is affected in the SIDS brainstem.  **Material and Methods** Using immunohistochemistry, to report the expression of PACAP and PAC1 in the human brainstem rostral medulla and pons, and compare quantitative expression in SIDS (n= 32) and non-SIDS (n= 12) and whether expression differed in SIDS according to the common risk factors of prone sleeping and cigarette smoke exposure.  **Results** For both PACAP and PAC1, expression was observed in all nuclei of the medulla and pons although of varying levels. SIDS compared to non-SIDS had no significant difference in expression for PACAP, whereas for PAC1, there was a significant decrease in the AN (p<0.001) of SIDS. Within  the SIDS dataset, analysis for the risk factors showed no difference.  **Conclusions** Given that the arcuate nucleus plays a significant role in sensing hypercapnic respiratory challenges, pH and blood pressure,the decrease in PAC1 may affect the way hypercapnic signals are received. In terms of SIDS, when infants are subjected to hypercapnic conditions, the decrease in receptor makes it challenging for the infant to activate compensatory mechanisms in order to counteract the increase in carbon dioxide. | |  |  |  |  | | --- | --- | | **CONTACT** | | | Name: | **Jessica** | | Lastname: | **Huang** | | E-mail: | **jhua6570@uni.sydney.edu.au** | | Country: | **Australia** | | Institution | **University of Sydney** | | Cellphone: | **+61425378206** | | City: | **NSW** | |