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| **Prematurity and low birthweight doesn't affect ASM thickness in SIDS/SUDC** |
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| **Introduction/Aim:** The cause for sudden infant death syndrome (SIDS) and sudden unexplained death in childhood (SUDC) is unclear. The layer of airway smooth muscle (ASM) in SIDS or SUDC infants is thicker compared with controls, suggesting that excessive bronchoconstriction contributes to these deaths. Prematurity and low birth weight (LBW) are risk factors for SIDS. We therefore examined the relation of prematurity and LBW to the thickness of the ASM layer and ASM shortening in cases of SIDS or SUDC.  **Methods:** Airways were available from 68 infants (post-mortem) who died between 1-18 month of age and were classified as SIDS or SUDC. In airway cross-sections, ASM layer thickness was calculated from ASM area divided by the perimeter of basement membrane (Pbm), determined by planimetry. ASM shortening was estimated morphometrically from the outer perimeter of measured ASM layer (Pmo) and the calculated relaxed perimeter (Pmor), whereby percentage of ASM shortening=(Pmor - Pmo)/Pmor×100. Analyses were grouped by airway size: small (Pbm, <1 mm) or large (Pbm, 1-4 mm). Two-way ANOVA was used to determine the effect of prematurity (<37 gestational weeks) and LBW (<2.5 kg) on ASM thickness and ASM shortening.  **Results:** Prematurity and LBW did not alter the thickness of the ASM layer in small (preterm, *P*=0.92; LBW, *P*=0.98) and large (preterm, *P*=0.58; LBW, *P*=0.93) airways of SIDS/SUDC cases. There was also no impact of prematurity and LBW on ASM shortening in small (preterm, *P*=0.19; LBW, *P*=0.93) and large (preterm, *P*=0.80; LBW, *P*=0.98) airways of SIDS/SUDC cases. In the large airways, there was a negative correlation between ASM shortening and age of death (*P*=0.04, r=-0.25).  **Conclusion:** Prematurity and LBW do not affect ASM thickness or shortening. Increased ASM shortening and airway narrowing seems to be more apparent in SIDS compared with SUDC.  **Grant Support:** Sir Charles Gairdner Hospital Research Foundation |