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PULMONARY FUNCTION AND NUTRITIONAL MORBIDITY IN CHILDREN AND ADOLESCENTS WITH CONGENITAL DIAPHRAGMATIC HERNIA

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Background: Failure to thrive (FTT) is a documented morbidity among congenital diaphragmatic hernia (CDH) survivors and may result from elevated respiratory effort. To our knowledge, this relationship has not been evaluated; we sought to examine body mass index (BMI), measured resting energy expenditure (mREE) and pulmonary function test (PFTs) results in children and adolescents with CDH.

Methods: With ethics approval (REB# 1000035323), anthropometrics, indirect calorimetry (IC) results and PFTs were collected from patients 5-17 years of age during CDH clinic visits from 2000-2015. FTT was defined as BMI z-scores <-2.0; mREE (as percent predicted REE) was measured using IC; forced expiratory volume in 1 second (FEV1) and forced vital capacity (FVC) were considered normal if >80% of reference ranges. Statistics completed with SAS v9.3.

Results: 77/118 patients who attended clinic had reproducible PFTs and anthropometrics. 31/77 had IC results. Mean BMI was -0.47±1.19 and 41.5% of patients were FTT; mean FEV1 (76.0±19.0) and FVC (78.0±20.9) were both below normal. A correlation was noted between BMI and PFTs (FEV1 $R=0.46$ $P<0.0001$; FVC $R=0.44$ $P<0.0001$). Mean mREE was 113±14% of expected with 68% of patients being hypermetabolic (mREE<110% predicted). IC results were not correlated with either FEV1 ($R=0.12$, $p=0.50$); or FVC ($R=0.22$, $p=0.23$).

Conclusions: These preliminary results suggest that a correlation may be present between BMI and lung function in CDH children and adolescents, whereas lung function does not seem to correlate with mREE. Additional research is underway to help explain these relationships.