p=0.014) on the leg press. For both exercises at 40% and 80% 1RM, no significant change in LVOT gradient was observed with coached breathing (with or without Valsalva maneuver) (Figure 1). In a sub-analysis of patients with oHCM no significant increase in the LVOT gradient was observed but during 40% 1RM leg press, there was a trend toward an increase in the median LVOT gradient (from 13.7mmHg (8.9-44.7) to 35mmHg (17.9-53.2), p=0.064). Systolic blood pressure, heart rate and cardiac index did not significantly change with resistance exercise. **Conclusion:** Participation in low and high intensity resistance exercises did not result in large increases in LVOT gradients regardless of breathing patterns. This may suggest loosening restrictions on resistance exercise in patients with HCM.

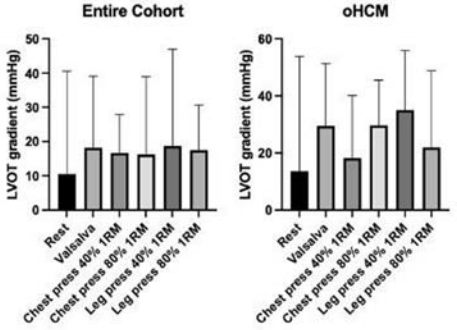

Figure 1: Effect of resistance exercise on LVOT gradient in entire cohort and subset of oHCM patients

RAPID FIRE SESSION – CARDIO-OBSTETRICS & CRITICAL ILLNESS (RF)

Presented Sunday, June 16, 1:00 PM-1:45 PM

Cardio-Obstetrics
RF-07 through RF-09

Critical Illness
RF-10 through RF-12

RF-07

Maternal Exposure to Ambient Ozone and Fetal Conotruncal Congenital Heart Defects in China A Large Multicenter Cohort Study

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Background: The association between conotruncal heart defects (CTDs) and maternal genetic and environmental exposures is well studied. However, little is known about air pollution and risk of CTDs. We aimed to investigate the association between maternal exposure to ozone and CTDs in China. **Method:** Pregnant women who underwent fetal echocardiography were consecutively recruited in our hospital between Jan 2013 and Dec 2021. The maternal sociodemographic and lifestyle characteristics and some fetal factors were obtained. Fetal echocardiography is used to evaluate the fetus with CTDs, as an outcome variable. Address of hospitals for prenatal checkups during Pregnancy was linked to estimate maternal exposure to ambient ozone during the first trimester, during 3 months prior to last menstrual period (LMP) and during periconception period. Adjusted logistic regression models were used to assess the associations between per 10 μg/m3 or per quartile increase in ambient ozone exposure and CTDs. **Results:** A total of 24,278 subjects were enrolled, of whom 1,069 had CTDs fetuses. Logistic regression analyses showed that maternal exposure to ambient ozone during three periods were associated with an increased risk of CTDs. The adjusted odds ratio and 95% confidence interval (CI) was 1.271(1.189-1.360) for per 10 μg/m3 increase in ozone during periconception period. Ozone was divided into quartiles, and the first quartile was used as a reference. The risk gradually increased with increasing exposure concentrations, with the most pronounced effect values during the periconceptional period (OR=2.206 for quartile 2, 2.367 for quartile 3, and 3.378 for quartile 4, all P<0.05). **Conclusions:** Maternal exposure to greater levels of ozone during the pregnancy, especially during the periconception period, is associated with higher risk of fetal CTDs. Further longitudinal well-designed studies are needed to confirm our findings.

Table 1 Estimated ORs and 95% CIsa of CTD associated with exposure to ambient O3 during periconcept

O_3 exposure	Model 1[c]ORs (95% CIs)[a]	Model 2[d]ORs (95% CIs)[a]	Model 3[e]ORs (95% CIs)[a]
Per 10 ug/m^3	1.361 (1.274, 1.454)	1.385 (1.296, 1.480)	1.271 (1.189, 1.360)
Quartile 1	Ref	Ref	Ref
Quartile 2	1.467 (1.212, 1.777)	1.499 (1.237, 1.816)	1.336 (1.089, 1.638)
Quartile 3	2.273 (1.831, 2.822)	2.285 (1.839, 2.839)	1.901 (1.433, 2.521)
Quartile 4	3.008 (2.236, 4.046)	3.122 (2.318, 4.206)	2.428 (1.716, 3.435)
P for linear trend[f]	<0.001	<0.001	<0.001

RF-08

Echocardiographic Parameters Associated with Future Hypertension in Patients with Preeclampsia

Anushree Puttur[1], Laith Alhuneafat[2], Kathryn Manalo[1], Sana Khan[1], Xiarepati Tieliwaerdi[1], Alexis Arrigo[1], Brent Williams[1], Indu Poornima[1]. [1]Allegheny General Hospital, Pittsburgh, PA; [2]University of Minnesota, Minneapolis, MN

Background: Preeclampsia (PrE) affects maternal health, and although echocardiograms are often performed in these cases, there is limited research on how echocardiographic changes influence outcomes. **Objectives:** The purpose of this study was to retrospectively evaluate the echocardiographic changes in women with PrE and their subsequent impact on diagnosis of hypertension at follow up. **Methods:** We retrospectively examined echocardiographic predictors for future diagnosis of hypertension in women with PrE within Allegheny Health Network. Echocardiograms were performed during or within the first 3 months of delivery. Exclusion criteria included age <18 years, diagnosis of pulmonary embolism, malignancy, autoimmune disease, and structural heart disease. Echo predictors of future hypertension (defined as use of antihypertensive medications or BP> 130/85 mm Hg in the postpartum period) was assessed by regression analysis after adjustment for age, body mass index, race, smoking status, gestational diabetes, and non-gestational diabetes. **Results:** Out of 252 women diagnosed with preeclampsia included in our study, 119 (47.22%) were subsequently diagnosed with hypertension during follow-up. Mean follow-up was 2.3 years. Elevated Left Ventricular Mass Index (LVMi) (86.28 vs 79.39, p=0.04), increased Interventricular Septal Thickness (IVSD) (1.06 vs 0.97, p<0.001), and higher Lateral e' (3.23 vs 3.06, p=0.03) were associated with a diagnosis of hypertension during follow-up. Additionally, having LVMi exceeding 95 g/m2 showed a significant association with future hypertension (Adjusted Odds Ratio 3.11, 95% CI 1.60 to 6.05, p<0.001).

Conclusion: Echocardiographic parameters during pregnancy or early postpartum can assist in stratifying the risk of future hypertension in patients with preeclampsia. This may facilitate closer monitoring and early intervention.

RF-09

An Innovative Quantitative Approach to Prenatal Screening of Critical Congenital Heart Disease using Machine Learning

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Objective: Prenatal diagnosis of critical congenital heart disease (CCHD) is essential for effective postnatal management. Access to high quality fetal screening is limited in many geographies as standard approaches require experienced physicians to establish diagnosis. We hypothesized that a machine learning approach to analysing quantitative fetal ultrasound data might overcome this limitations and allow for a more equitable and cost-efficient access to high-quality fetal screening. **Methods:** Between August 2010 and April 2021, a total of 40,637 fetal cases were extracted from the Maternal-Fetal Medicine Consultation Center Database at Anzhen Hospital. Among these, 7,663 cases were identified with CHD, comprising 1,391 cases of CCHD and 6,272 cases of non-critical CHD. Additionally, 10,692 normal fetal cases were randomly chosen as the control group for this study. First, determine the percentile normal value range for 63 ultrasound parameters in fetuses at different gestational ages, expressed as Quantile-score (Q-score). The Q-score=50% serves as the central point in the distribution of the normal population. Next, calculate the Q-score for all parameters associated with both CCHD and non-critical CHD. Compute the difference between their scores and the median Q-score=50%, providing a quantitative measure of the single-parameter abnormality degree. The average abnormality degrees for multiple parameters serve as the evaluation metric for the sample's abnormality degree. Finally, employing a sequential forward selection method, a screening OPS for individual CCHD was formulated. Following this, using 15 types of CCHD as a collective disease entity, an algorithmic model for the OPS in prenatal screening CCHD was developed. **Results:** The machine learning approach achieved screening sensitivities ranging from 2.3% to 100.0% and specificity ranging from 47.9% to 94.2%. The OPS for screening all 15 types of CCHD as a collective disease comprises 9 parameters: PA/AO, PV-Vs, PA, AO, CA, RV/LV, Arch-Vs, AV-Vs, RUA-RI, with a sensitivity of 89.6% and specificity of 81.13%.For clinically relevant conditions (PTA, TA, PA/IVS, HRHS, HLHS, and TOF) the algorithm achieved sensitivity and specificity values exceeding 90% and 80%, respectively. **Conclusion:** The current study provides a novel approach for identifying CCHD using routine fetal ultrasound data. It established a simple algorithmic model for screening using ultrasound parameters that can be acquired by less trained technicians in various settings and may contribute to cost-effective, accessible and equitable fetal screening.

RF-10

Clinical Consequences of Acute Stress Cardiomyopathy in Young Adults with Severe Sepsis: Insights from an Inpatient Database Study

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Background: Acute stress cardiomyopathy, commonly referred to as a transient apical ballooning syndrome, is characterized by a temporary disruption in left ventricular function, frequently instigated by acute stressors. The prevalence and consequences of this condition in younger individuals (<50 years) suffering from severe sepsis are not well-established. This study uses the national inpatient registry to delineate the clinical outcomes associated with acute stress cardiomyopathy in this specific patient population. **Methods:** A retrospective cohort study was conducted using the National Inpatient Database spanning from 2016 to 2020. We focused on patients aged below 50 diagnosed with severe sepsis and concurrent acute stress cardiomyopathy, identified through ICD-10 codes, and they were matched using propensity score matching with patients with sepsis without acute stress cardiomyopathy. The primary endpoint was hospital mortality. Secondary measures included the duration of hospitalization, the necessity for ventilatory support, and the occurrence of significant cardiac complications. Analytical methods comprised descriptive statistics, chi-square tests, and logistic regression. **Results:** We included 1,381 patients, fulfilling the inclusion criteria. Of these, 70% were female. The hospital mortality rate for patients with severe sepsis and acute stress cardiomyopathy was 15%. The mean hospital stay was 9 days, and 25% of patients required mechanical ventilation. Logistic regression suggested that female gender, diabetes, and obesity, were significant mortality predictors ($p<0.05$). Compared to a control group of sepsis patients without cardiomyopathy, the study group exhibited a notably higher mortality rate (15% vs. 8%, $p<0.01$). **Conclusion:** Young adults with severe sepsis who develop acute stress cardiomyopathy face adverse in-hospital outcomes, including increased mortality, more frequent need for mechanical ventilation, and lengthier hospital stays. Prompt identification and tailored treatment approaches for this subset of patients are imperative.

Table: Baseline Patient and Hospital Characteristics in Tako-Tsubo Cardiomyopathy Study

Variable	Overall %	TTC %	NON-TTC %	p
		N = 1381	N=1595	
Patient's Characteristics				
Mean Age, in years	47	45	48	<0.001
Gender				<0.001
Female	60%	70%	55%	
Male	40%	30%	45%	
Racial Distribution				<0.001
White	55%	60%	53%	
Black	20%	15%	22%	
Hispanic	15%	10%	17%	
Asian/Pacific Islander	5%	7%	4%	
Native Americans	3%	2%	3%	
Others	2%	1%	2%	
Insurance Type				<0.001
Medicaid	30%	25%	32%	
Medicare	40%	50%	35%	
Private	20%	15%	22%	
Uninsured	10%	10%	11%	
Comorbidities				<0.001
Hypertension	40%	45%	38%	
Diabetes Mellitus	30%	35%	28%	
Hyperlipidemia	25%	20%	27%	
Chronic Obstructive Pulmonary Disease (COPD)	15%	10%	17%	
Coronary Artery Disease	10%	12%	9%	
Previous Stroke	5%	7%	4%	
Hospital Characteristics				<0.001
Hospital Region				<0.001
Northeast	25%	20%	27%	
Midwest	20%	22%	19%	
South	30%	35%	28%	
West	25%	23%	26%	
Hospital Bed Size				0.0751
Small	30%	28%	31%	
Medium	35%	40%	33%	
Large	35%	32%	36%	
Hospital Location				0.6889
Rural Location	15%	10%	17%	
Urban Location	85%	90%	83%	