A Comparative Study of Access to Fetal Echocardiography in Hospital-based versus Ambulatory sites at a Single Cardiac Center

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INTRODUCTION

- Prenatal detection (PND) and counseling of congenital heart disease by fetal echocardiography (FE) improves outcomes and allows families time to plan for delivery.

- Less wealthy neighborhood of origin and rurality are associated with lower likelihood of obtaining PND of important fetal cardiac disease.

- The two primary methods of FE delivery, ambulatory vs. hospital-based have not been compared in detail

OBJECTIVES

- To compare socioeconomic status (SES) and geographic characteristics of pregnant women receiving FE at a large surgical center, Children's National Hospital (CNH) versus a community-based outreach maternal-fetal medicine (MFM) clinics.

- To assess access patterns of timing and distance to FE.

METHODS

- A retrospective comparative effectiveness study of differences in patients using tertiary care versus MFM FE visits from January-February 2022.

- Collected maternal age, FE indication, fetal gestational age, and maternal address (used to gather SES and geo. Data)

- Custom software (CDXZipstream, 2018, Version 1.1 Bridgewater, Nj) was used to extract census tract variables (based on 2020 Census) reflecting wealth, income, education and occupation from maternal address.

- A neighborhood summary score (NSS) (Peiris et al 2009) was calculated using 6 variables used to create composite Z score (NSS)

- Continuous variables were compared using a t test. SES variables were assessed individually and as a composite score (NSS)

Table 1: Comparison of SES and MFM Cohorts

Characteristic	CNH	Community Outreach	P value
Total patients included(n)	178	94	
Composite SES z score	0.2 ± 2.8	0.6 ± 2.4	0.572
Average maternal age at time of FE (years)	33.6 ± 5.8	35.14 ± 5.74	**0.024***
Average gestational age at time of FE (weeks)	25.5 ± 4.4	23.7 ± 3.2	**0.0010***
% HH living in poverty (%)	9.4 ±7.8	7.6± 6.7	0.070
% Employed persons age 16+ in professional occupations (%)	52.6 ±18.2	54.0 ± 17.1	0.527
% persons 25+ Bachelor's Degree or higher (%)	45.6 ± 24.2	52.8 ± 10.9	**0.027***
Poverty (>20% census block)	18/177	4/94	
Distance to care center (miles)	26.5 ± 80.6	14.3 ±10.9	0.153
Time to care center, driving (minutes)	42.9 ± 36.6	24.7 ± 13.8	**<0.001***
Time to care center, public transportation (minutes)	150.6 ± 230.0	97.538 ± 111.0	**<0.001***

Figure 1: Map of MFM Clinics with SES measured by % of population with income below poverty line (last 12 mo.) (ArcGIS)

RESULTS

- A total of 272 patients were studied (CNH: n=178; and MFM: n=94)

- No significant differences found in SES composite score.
- No patients in either cohort lived in a rural census tract.

- MFM patients were older on average than those who received an echo at CNH (35.1 ± 5.7 vs 33.6 ±5.8 years, p=0.02)

- MFM cohort lived in areas with a higher percentage of people having completed a bachelors' degree or higher (52.8 ± 10.9 vs 45.6 ± 24.2, p=0.03)

- GA at FE earlier among the MFM cohort (23.7± 3.2 vs 25.6 ± 4.4, p=0.001).

- Driving time and public transport time to clinic were lower in the MFM cohort.

CONCLUSIONS

- Neither care method was accessed by patients in rural or lowest SES areas, possibly reflecting lower MFM availability in some areas

- Novel methods of outreach for FE are needed leveraging the strengths of current community-based methods to improve access for rural and less wealthy populations.

LIMITATIONS

- Small population size, short window of data collection

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