Comparison of first trimester transvaginal anatomy scan to the second trimester structural survey in normal weight and obese populations: A pilot study.

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Background

- Obesity in pregnancy - gestational hypertension/preeclampsia, diabetes, increased cesarean rate, IUGR, Macrosomia, increased incidence of fetal anomalies
- Detection rates of up to 75-98% during 1st trimester TVUS in normal weight patients
- Early scan can detect 50-80% of fetal anomalies in obese patients
- Objective: to compare visualization of 1st trimester TVUS to 2nd trimester TAU in normal weight and obese patients

Methods

- Prospective, single center, cross-sectional study design
- 1st trimester TVUS at time of NT screen 12-14w
- Included:
  - singleton pregnancies
  - met dating criteria by LMP and CRL
  - desired 1st trimester genetic screening
  - willing to have a TVUS
- Excluded:
  - Multiples
  - known anomalies

Methods

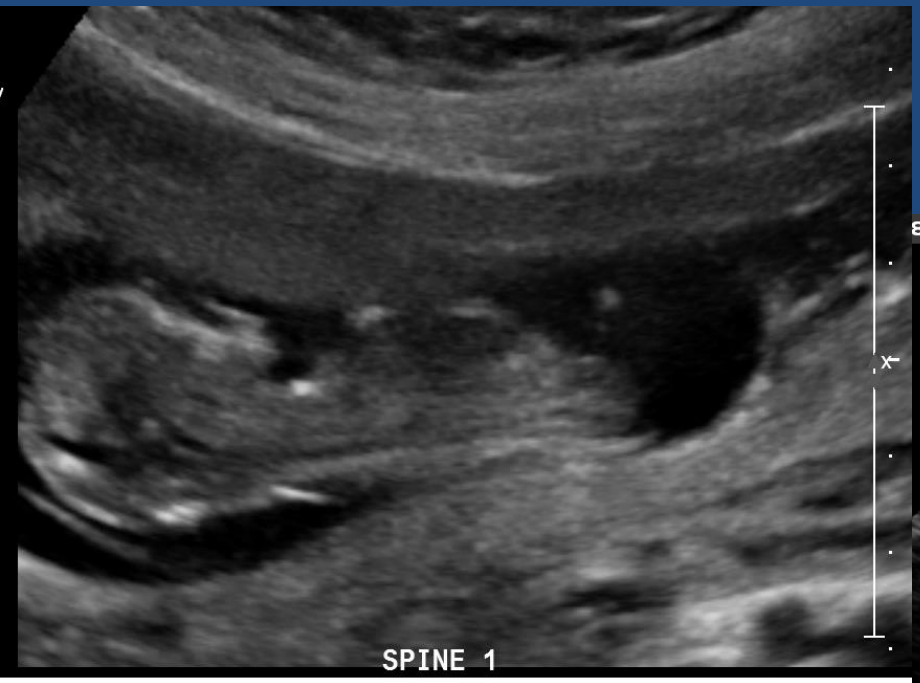
- Power 80%, alpha .05 – 22 patients
- Study Patients:
  - Obese BMI ≥ 30kg/m2
  - Normal weight < 30kg/m2
- Scans
  - TVUS in 1st trimester
  - TAU in 2nd trimester
- For each structure: % with optimal visualization
- Risk ratios calculated

Results

- 25 patients enrolled and underwent TVUS 12-14 weeks
- 24 patients completed TAU at 18-22 weeks (1 lost to follow up)
- Average BMI
  - Obese 34kg/m2
  - Non-obese 23kg/m2

Results

- Structural Survey in obese patients (left) normal weight (right)



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Baseline characteristics

Table 1. Baseline characteristics Obese Patients

	Control	Obese	p-value
No. of cases	15	10	
Age (y)	28.63 (6.11)	27.8 (6.20)	.2
BMI* (kg/m^2)	**23.43 (3.35)**	**33.96 (3.67)**	**<.001**
Gestational Age at 1st trimester scan	12w4d (6.12)	12w3d (6.20)	0.23
Length of time for scan (min)	10.1 (3.55)	11.6 (6.66)	.6

*Body mass index

Data are n or average (SD)

Obese Patients

	1st Trimester	2nd Trimester	RR
Cerebellum	30	100	3.33
Lateral Ventricles	NA	100	NA
Cisterna Magna	30	100	3.33
CSP	0	100	100
Falx Cerebri	60	100	1.67
Choroid Plexus	90	100	1.11
NT/Nuchal Fold	100	100	1.43
Orbits	90	100	1.11
Nose/Mouth	10	90	9
Diaphragm	50	100	2
Stomach	100	100	1
Kidneys	50	100	2
Abdominal Wall	90	100	1.11

Obese Patients

	1st Trimester	2nd Trimester	RR
4 Chamber View	30	80	2.67
3 Vessel View	20	70	3.5
RVOT	20	80	4
LVOT	30	80	2.67
3 Vessel Cord	50	100	2
Cord Insertion	80	100	1.25
Bladder	100	100	1
Cervical Spine	40	90	2.25
Thoracic Spine	40	90	2.25
Lumbar Spine	40	90	2.25
Limbs	80	100	1.25
Hands	50	80	1.6
Feet	50	80	1.6

Normal Weight Patients

	1st Trimester	2nd Trimester	RR
Cerebellum	31	100	3.23
Lateral Ventricles	NA	100	5.32
Cisterna Magna	31	100	3.23
CSP	12.5	100	8
Falx Cerebri	50	100	2
Choroid Plexus	100	100	1.6
NT/Nuchal Fold	100	100	1.6
Orbits	75	100	1.33
Nose/Mouth	12.5	90	8
Diaphragm	68.8	100	1.45
Stomach	100	100	1
Kidneys	43.8	100	2.28
Abdominal Wall	93.8	100	1.07

Normal Weight Patients

	1st Trimester	2nd Trimester	RR
4 Chamber View	30	80	2.67
3 Vessel View	20	70	3.5
RVOT	20	80	4
LVOT	30	80	2.67
3 Vessel Cord	50	100	2
Cord Insertion	80	100	1.25
Bladder	100	100	1
Cervical Spine	40	90	2.25
Thoracic Spine	40	90	2.25
Lumbar Spine	40	90	2.25
Limbs	80	100	1.25
Hands	50	80	1.6
Feet	50	80	1.6

Cerebellem

- TAU on left, TVUS on right

Conclusions

- 1st trimester TVUS detects many of the structures assessed during anatomic survey
- 1st trimester TVUS not superior to 2nd trimester TAU in obese or normal weight women