

# Fetal Echogenic Bowel



This guideline was updated in November 2015 by Dr Jerome Mayers, with input from members of the New Zealand Maternal Fetal Medicine Network.





## Background

Evaluation of the fetal abdomen is an established component of second trimester ultrasound screening. This includes evaluation of bowel echogenicity with appropriate transducers and gain settings.

Physiological midgut herniation in the first trimester precludes assessment of fetal bowel in the first trimester. Prevalence of fetal echogenic bowel in the second trimester is 1%. In normal fetuses, it is a rare finding and resolves with no adverse sequelae. Fetal bowel is often echogenic in the third trimester and is not considered to be clinically significant. Defined as fetal bowel with homogenous areas of echogenicity equal to or greater than surrounding bone. It can be focal or multifocal. There is associated considerable debate as there is much interobserver and intraobserver variability.

Echogenic bowel is a non specific sonographic finding. In isolation, echogenic bowel is a benign condition and the vast majority of fetuses are normal. It can however be associated with increased risk of chromosomal and non chromosomal fetal abnormalities and prognosis is usually less favourable in these cases. Possible underlying pathology include inspissated meconium, decreased vascularity, bowel hypotonia and swallowed blood.

Timely referral, consultation and investigation is important.

## Objective

To guide accurate diagnosis, investigation and management of women suspected of having fetal echogenic bowel.



## Definition

Abnormal bowel echogenicity equal or greater than bone.

## Grading

- Grade 0 < liver
- Grade 1 > Liver < Bone
- Grade 2 = bone
- Grade 3 > bone

## Differential Diagnosis

The majority of fetuses with isolated fetal echogenic bowel carry a good prognosis. Up to 35% of fetuses with echogenic bowel may have underlying pathology, but in many of these cases echogenic bowel is not an isolated finding.

### Fetal aneuploidy

- Aneuploidy rates of 3 to 25% have been reported
- Most commonly Trisomy 21 which is 5.5 times the a priori risk
- Includes Trisomy 13,18 and the sex chromosomes
- Isolated finding in 9% of fetuses with aneuploidy
- Positive likelihood ratio of 11.44 (9.05-14.47)

### Non chromosomal

- Cystic fibrosis (diagnosed in 3% of foetuses with echogenic bowel (meconium))
- Intra-amniotic bleeding: swallowing of blood



- Congenital malformations of the bowel: atresia, proximal obstruction, perforation, meconium peritonitis, Hirschsprung's disease
- IUGR with increased risk perinatal morbidity and mortality: (mesenteric ischemia)
- Congenital infection (0 – 10% association with echogenic bowel): CMV (most commonly detected infectious agent), Toxoplasmosis
- **Other:** fetal alcohol syndrome, alpha thalassaemia homozygous

## Important History

- Past obstetric history and any anomalies
- Any family history of note - in particular cystic fibrosis, aneuploidy, syndromes
- History of uterine/vaginal bleeding (swallowed blood)
- Any symptoms suggestive of a viral/bacterial illness
- A priori risk for aneuploidy

## Ultrasound

Usually diagnosed on routine 2<sup>nd</sup> trimester USS (16-20 weeks).

### The Equipment

- Transducer frequency:  $\leq 5\text{MHz}$ .
- High frequency transducers falsely increase echogenicity
- Lowest gain possible

### The Views

- Abdominal views: bowel, liver and bone
- Sagittal and coronal views: compare with liver and spine
- Transverse pelvis views: compare with iliac crest



## The Findings

1. Bright as bone:
  - Compare echogenicity to liver and bone (Iliac crest used as reference)
  - Normal bowel echogenicity > liver < bone
  - Care not to over diagnose
  - If there is difficulty discerning whether bowel is as echogenic as bone, decrease the gain to see which structure disappears first
2. Usually focal, mass like and in the lower abdomen:
3. CF and aneuploidy tend to be multifocal and CMV focal
4. Most common associated sonographic abnormality
5. changes in amniotic fluid volume (poly and oligohydramnios)

## Important to determine if isolated or associated with other major structural anomalies

1. Detailed review of anatomy, growth and placenta
2. Assess markers for aneuploidy
  - Major structural abnormality
  - Nuchal thickening
  - Hypoplastic/absent nasal bone
  - Short femur / humerus
  - Intracardiac echogenic foci
3. Assess markers of infection
  - Microcephaly, ventriculomegaly, cerebral calcifications
  - Hydrops
  - SGA/IUGR



## Investigation

### 1. Fetal genetic assessment

#### a. Amniocentesis

- Karyotype
- PCR for virology: Toxoplasma, CMV
- DNA analysis: Cystic fibrosis

- #### b. Cell-free DNA in maternal blood – can be offered to those women who decline amniocentesis. However, these patients must be counselled that cell-free DNA is a screening test and if positive, an amniocentesis would be recommended for confirmation.

### 2. Maternal

- Virology screen : Toxoplasma, CMV

### 3. Parental cystic fibrosis carrier status screening :

- Detects 80% of carriers
- Not all mutations can be identified and this does not exclude the possibility

## Prognosis

- Usually resolves but still requires investigation
- In isolated cases often benign condition carrying a favourable prognosis
- Outcome in those cases of isolated echogenic bowel – probably normal, no clear evidence long-term bowel problems



## On-going Management

Increased fetal surveillance via monthly growth scans as there is an increased risk of IUGR and intrauterine death.

## References

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