Introduction

- Obstetric management depends on accurate estimation of fetal weight (EFW) and early identification of small for gestational age (SGA).
- Fetal weight is difficult to estimate in gastroschisis due to the extra abdominal herniation of bowel.
- Identification of SGA changes depending on the population data used as reference.
- Incidence/diagnosis of SGA is 15-60% in gastroschisis and affects the obstetric management.
- Different models for EFW and their accuracy in predicting birthweight and their performance in detecting SGA were compared.

Methods

- 73 cases of gastroschisis (Jan 2011 – Dec 2017) managed at Westmead Hospital were analysed.
- EFW using most recent US data within 14 days of delivery for 5 published models were compared.
- The difference between predicted and actual birthweight for each model was compared.
- SGA were identified using Australian birthweight, Intergrowth217 and Nicolaides (2018) datasets.
- McNemar’s test was used to analyze the agreement between the true incidence of SGA at birth and the incidence calculated from the EFW using the different models.
- The sensitivity and specificity in predicting SGA for each formula was calculated in reference to each population study.

Results

<table>
<thead>
<tr>
<th>Model</th>
<th>Mean Difference +/- SD (g)</th>
<th>95% Limits of agreement</th>
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</thead>
<tbody>
<tr>
<td>Hadlock et al</td>
<td>163 +/- 302 g</td>
<td>-429 to 755</td>
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<tr>
<td>Hadlock et al 3</td>
<td>135 +/- 285 g</td>
<td>-424 to 694</td>
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<tr>
<td>Warsof et al</td>
<td>205 +/- 306 g</td>
<td>-394 to 804</td>
</tr>
<tr>
<td>Shepard et al</td>
<td>-69 +/- 344 g</td>
<td>-743 to 605</td>
</tr>
<tr>
<td>Honovar et al</td>
<td>-108 +/- 352 g</td>
<td>-798 to 583</td>
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</tbody>
</table>

Table 1. Both Hadlock models and Shepard demonstrated a mean difference in estimation of fetal weight <200g. Shepard was the most accurate at estimating fetal weight with a mean difference of -69g.

Figure 1. Hadlock 1 model has the best combined Sensitivity (83) and Specificity (83) when using the Intergrowth21 data set.

Figure 2. There was no significant difference between the incidence of SGA reported using Hadlock model and incidence using birthweight when using Intergrowth21.

Conclusion

- Shepard model may be more accurate at predicting EFW in gastroschisis; though the difference with Hadlock model is not clinically significant.
- The incidence of SGA, sensitivity/specificity varies significantly depending on the reference used for fetal weight. Intergrowth21 potentially underestimates SGA and Nicolaides et al overestimates SGA.
- There is potential for an improved model for estimating fetal weight and detection of SGA in gastroschisis. This may include third trimester growth velocity and abdominal circumference in an attempt to distinguish between protein loss through exposed bowel and true utero-placental insufficiency.