selective IUGR II (and III)

Expectant management and Cord Occlusion

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www.fetalmedicinebarcelona.org
1. Diagnosis and types
2. Expectant vs active management
3. Results with Cord Occlusion
4. Conclusions
1. Diagnosis and types
2. Expectant vs active management
3. Results with Cord Occlusion
4. Conclusions
MC twins: apparent discrepancy in AF and/or fetal size
Algorithm for differential diagnosis

AF: > 8 cm (> 10 cm) / < 2cm
Clearly discordant bladders

no

EFW <P10 (+/- disc 25%)

no

yes

TTTS

yes

sIUGR

nothing for the moment
Close surveillance

• discordant for AF
• discordant for EFW

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Gratacos et al. Fetal Diagn Ther 2012
MC-sIUGR and UA Doppler in the IUGR fetus

No change in Doppler pattern from diagnosis (≈20w) to delivery
Lee 04, Vanderheyden 05, Gratacós 04, 07

Normally good prognosis

GA @ delivery 29-32 weeks
Survival 50-65%
Neurological damage 10-30%
Quintero 03, Gratacós 04, Vanderheyden 05, Huber 06, Ishii 09

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1. Diagnosis and types

2. Expectant vs active management

3. Results with Cord Occlusion

4. Conclusions
sIUGR is not a unique disease as TTTS

DETERMINANTS OF MANAGEMENT

Severity

GA / Discordance / REDF / DV-

Expectant

Cord Occlusion

Laser

Technical issues

Parents’ wishes

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Decision tree for counseling in sIUGR

1: DIAGNOSIS
sIUGR + no TTTS

2: sIUGR TYPE

I

II

III

3: SEVERITY
GA<24w /Disc >35%
AREDV /DV>p95

Expectant + Follow-up 1/w

NO

YES

Expectant + Follow-up 1/w

Active Management

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1. Diagnosis and types
2. Expectant vs active management
3. Results with Cord Occlusion
4. Conclusions
CORD OCCLUSION IN sIUGR

n=90 (2006-2013)

- <p10 + >25% discordance
- 38 type II / 52 type III
- 100% on severity criteria (GA<22w or Disc >35% or AREDF or DV>p95)
- Entry in SGA sac (+/- amnioinfusion) OR septostomy + cord section

<table>
<thead>
<tr>
<th></th>
<th>Median (range) GA at surgery (w)</th>
<th>Median (Range) duration (min)</th>
<th>Only-Mainly Bipolar / Laser (%)</th>
<th>Entry in SGA sac</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20.7 (15-25)</td>
<td>23.5 (9-53)</td>
<td>94 % / 6 %</td>
<td>94%</td>
</tr>
</tbody>
</table>
## Pregnancy Outcomes

<table>
<thead>
<tr>
<th>Event</th>
<th>Rate</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscarriage &lt;24w</td>
<td>5.5%</td>
<td>5/90</td>
</tr>
<tr>
<td>Delivery &lt; 32 w</td>
<td>12.2%</td>
<td>11/90</td>
</tr>
<tr>
<td>GA @delivery (w)</td>
<td>36.3 (15-25)</td>
<td></td>
</tr>
<tr>
<td>Survival</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGA</td>
<td>93.3%</td>
<td>84/90</td>
</tr>
<tr>
<td>Overall</td>
<td>47%</td>
<td>84/180</td>
</tr>
<tr>
<td>Birthweight (g)</td>
<td>2586 ± 865.3</td>
<td></td>
</tr>
<tr>
<td>Periventr. Leukomalacia</td>
<td>1.1%</td>
<td>1/90</td>
</tr>
</tbody>
</table>

### Figures
- **GA @ delivery (w)**: 36.3, 36.1, 36.7
- **Survival AGA (%)**: 93.3, 93.7, 93.1
CORD OCCLUSION IN sIUGR

Pregnancy Outcomes

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Parra (n=90)</th>
<th>Chalouhi (n=24)</th>
<th>Bebbington (n=22)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miscarriage &lt;24w</td>
<td>5.5 % (5/90)</td>
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<td>2586 ± 865.3</td>
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</tbody>
</table>

*Bebbington et al: Estimate.*
Overall Survival
46% vs 54%

Survivors per 100 fetuses

Survival AGA (%)
Survival SGA (%)
1. Clinical forms

2. Expectant vs active management

3. Results with Cord Occlusion

4. Conclusions
Conclusions
Management of sIUGR II and III in MC twins

II: AREDF
1. Expectant management is associated with poor survival and neurological outcome

2. Active management in sIUGR protects normal fetus but worsens that of IUGR.

III: iAREDF
3. Final decision: balance between severity + parents’ wishes (+ rarely technical issues).

4. Cord occlusion: more radical but >90% survival, reduces instances preterm birth and severe IUGR
Poor prognosis: high risk of IUFD and neurological damage for both twins

MODULATORS
- Severity
- Parents’ wishes
- Technical aspects

EXPECTANT  CORD OCCLUSION  LASER
LASER THERAPY IN sIUGR

Feasible 90%
More difficult than TTTS
• NO polihydramnios (amnioinfusion/drainage required)
• equator often in smaller sac
• type and size of anastomoses

www.fetalmedicinebarcelona.org/
slUGR in MC twins with abnormal Doppler (II and III) pooled published data with different management schemes

<table>
<thead>
<tr>
<th></th>
<th>Expectant (n=138)</th>
<th>Laser (n=50)</th>
<th>Cord Occlusion (n=98)</th>
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</thead>
<tbody>
<tr>
<td><strong>GA@delivery</strong></td>
<td>29-32</td>
<td>32-35</td>
<td>33-37</td>
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<tr>
<td><strong>Survival AGA</strong></td>
<td>70-85 %</td>
<td>70-90 %</td>
<td>&gt;90 %</td>
</tr>
<tr>
<td></td>
<td>40-85 %</td>
<td>30-40 %</td>
<td>0 %</td>
</tr>
<tr>
<td><strong>Survival IUGR</strong></td>
<td>70-85 %</td>
<td>70-90 %</td>
<td>&gt;90 %</td>
</tr>
<tr>
<td></td>
<td>40-85 %</td>
<td>30-40 %</td>
<td>0 %</td>
</tr>
<tr>
<td><strong>Sequelae (*) AGA</strong></td>
<td>15-35%</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
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<tr>
<td></td>
<td>25-50%</td>
<td>15%</td>
<td>-</td>
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<tr>
<td><strong>Sequelae (*) IUGR</strong></td>
<td>15-35%</td>
<td>&lt;5%</td>
<td>&lt;5%</td>
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<tr>
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<td>25-50%</td>
<td>15%</td>
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(*limited info - small series)

Quintero 03, Gratacós 04-10, Vanderheyden 05, Ishii 09, Chaloui 12, Parra 14 (*), Nicolaides 14(*)
(* unpublished data)
### sIUGR in MC pregnancy

#### Tentative management scheme

<table>
<thead>
<tr>
<th>Type</th>
<th>I</th>
<th>II</th>
<th>III</th>
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<tbody>
<tr>
<td></td>
<td>UA N</td>
<td>AREDV</td>
<td>iAREDV</td>
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<table>
<thead>
<tr>
<th>Subtype</th>
<th>a</th>
<th>b</th>
<th>a</th>
<th>b</th>
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<tbody>
<tr>
<td></td>
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<td>AREDV / Disc&gt;35%, DVpatol</td>
<td></td>
<td>AREDV / Disc&gt;35%, DVpatol</td>
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<table>
<thead>
<tr>
<th>Follow up</th>
<th>2w</th>
<th>1w</th>
<th>1w</th>
<th>1w</th>
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<table>
<thead>
<tr>
<th>Attitude</th>
<th>Expectant</th>
<th>Discuss expectant</th>
<th>Discuss therapy</th>
<th>Discuss expectant</th>
<th>Discuss therapy</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Consider delivery (if not treated)</th>
<th>34-35w</th>
<th>32w</th>
<th>30w DV&gt;95 &gt;26w if DV atrial flow neg</th>
<th>33-34w</th>
<th>30w DV&gt;95 &gt;26w if DV atrial flow neg</th>
</tr>
</thead>
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Fetal Diagn Ther 2014

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CO (n=90 - Bcn)
Laser type III (n=32 - Bcn)
Laser type II (n=135 - FMF)
Laser II/III (n=23 - Paris)

Overall Survival
46% vs 54%

Survivors per 100 fetuses

GA @ delivery (w)
Survival AGA (%)
Survival SGA (%)

CO  Laser

Overall Survival
46% vs 54%

Survivors per 100 fetuses

CO  Laser

Overall Survival
46% vs 54%

Survivors per 100 fetuses

CO  Laser

Overall Survival
46% vs 54%

Survivors per 100 fetuses

CO  Laser

Overall Survival
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