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Disclosure

• I and my spouse/partner have no relevant relationships with commercial interests to disclose.
Prescription drug use is on the rise and prescribing practices may vary

- Increase in use over the course of a 33-year study (Mitchell et al 2011)
- Women are delaying pregnancy (National Vital Statistics Reports 2015)
- Higher rates of obesity and chronic medical conditions
- Variability in prescription practices
- Most drugs are used off-label

Daw et al. Pharmacoepidemiology & Drug Safety, 2011

AMIA 2017
Pharmacogenetics data on medications may be used to find effective and safe doses

- FDA includes pharmacogenomics information in the labeling of several medications commonly prescribed in pregnant women.

- Maternal pharmacogenetics will play a role in determining disposition and response to drugs.

- Initial steps to understand value to obstetric health care providers.
Survey to assess perceived needs of obstetric healthcare providers at Hopkins

- Demographics (specialty, years practicing, etc.)
- Experience adjusting drug dose in pregnant women
- Experience treating pregnant women with drugs known to be influenced by genetics
- Opinions about resources for using genetics to guide drug dosing in pregnant women
## Survey study sample

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Healthcare Providers (N=31) N(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>27 (87%)</td>
</tr>
<tr>
<td>Experience</td>
<td></td>
</tr>
<tr>
<td>Resident</td>
<td>10 (32%)</td>
</tr>
<tr>
<td>Attending</td>
<td>17 (55%)</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
</tr>
<tr>
<td>Obstetrics</td>
<td>29 (94%)</td>
</tr>
<tr>
<td>Gynecology</td>
<td>2 (6%)</td>
</tr>
<tr>
<td>Years since completing training</td>
<td>Median 10 (1-36)</td>
</tr>
</tbody>
</table>
Finding: Dose adjustments are common and involve several characteristics

- Organ system function (84%)
- Body weight (81%)
- Height (31%)
- Body surface area (47%)
- Genetics (16%)
- Other characteristics (16%)

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Finding: For OBs that prescribe meds, many respondents indicated a range of comfort levels with prescribing meds

- **9 antiretroviral meds**
  - 35-45% do not prescribe
  - 26-29% very uncomfortable or uncomfortable

- **4 antihypertensive meds**
  - 3-23% do not prescribe
  - 6-16% very uncomfortable or uncomfortable

- **14 antidepressants meds**
  - 10-41% do not prescribe
  - 6-30% very uncomfortable or uncomfortable
Finding: Around half of OBs believe genetics-informed dose adjustment is critical for good outcomes for the treatment of pregnant women.

Important or Very Important for Good Outcomes

Treated conditions during pregnancy

- HIV: 42%
- Hypertension: 48%
- Depression: 48%
**Finding:** OBs are largely unaware of resources for clinical guidance on genetics-informed drug dose use in pregnancy

- Rarely seek outside consultation for drug dosing (<25% of the time)

- 37% were aware of any resources for clinical guidance on genetics-informed dosing
  - FDA resources, Micromedex®, REPROTOX®, UpToDate®, OMIM®, PubMed, lab report
  - 70% indicated moderately or slightly convenient to obtain
Finding: OBs would find it valuable to have access to a consult service to provide genetics-informed dosing guidance for pregnant women

- 81% (25) overall

Obstetric healthcare providers that value access, according to perceived importance

- Antidepressants: 60% (High) vs 50% (Low)
- Antihypertensives: 67% (High) vs 44% (Low)
- Antiretrovirals: 55% (High) vs 54% (Low)
Finding: OBs would find it valuable to have access to an app to provide genetics-informed dosing guidance for pregnant women.

- Yes-as a mobile app, embedded in the EHR and/or as an app I can install on a tablet or cell phone
- Maybe-I'm not sure if I would find such a tool valuable
- No-I would not find such a tool valuable

AMIA 2017
Finding: OBs would find it valuable to have access to an app to provide genetics-informed dosing guidance for pregnant women.

Obstetric healthcare providers that value access, according to perceived importance:

- Antidepressants: 93% High, 69% Low
- Antihypertensives: 93% High, 69% Low
- Antiretrovirals: 94% High, 61% Low

AMIA 2017
Finding: OBs would find it valuable to have access to clinical guidance via multiple modalities

- Yes-as a mobile app (accessible from a tablet or cell phone): 64%
- Yes-as an app embedded in the EHR: 68%
- Yes-as an app that I can install on my desktop: 36%
Summary of points

• Dose adjustments are common in pregnant women, with outside consultation rarely used
  – Genetics is rarely used

• Few indicated an awareness of clinical guidance on genetics-informed dosing or had ever used any

• Most would find access to genetics-informed dosing information valuable
  – As an app in the EHR, app installed on a tablet or cell phone, app installed on a desktop

• This study provides insights into CDS needs of OBs AMIA 2017
Limitations

- Johns Hopkins University obstetric healthcare providers
- We did not assess differences between residents and attending physicians
Future work

- Drug dosing guidance based upon models that integrate multiple patient characteristics

- CDS to complement information required by the PLL rule (provides information about testing, contraception, infertility)

- Influence of pharmacogenomics on fetal exposure to medications

- Monitor prescribing patterns to determine the impact of providing genetics-informed dosing guidance via CDS
• Dose adjustments are common in pregnant women, with outside consultation rarely used

• Few indicated an awareness of clinical guidance on genetics-informed dosing or had ever used any

• Most would find access to genetics-informed dosing information valuable

• This study provides insights into CDS needs of OBs

Thank you

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