HAART-associated risk of preeclampsia in HIV+ women

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Abstract

HIV during pregnancy is associated with adverse maternal and fetal outcomes such as preterm birth, low birth weight, maternal and fetal death. Interestingly, HIV is associated with a reduction in preeclampsia and other hypertensive disorders. HAART is very effective at preventing mother to child transmission. HAART may be effective at preventing preeclampsia in women receiving HAART: a matched cohort study. The database search generated 106 publications, reduced to 35 after removing duplicates. Features of the studies included for final analysis are included for each study. A more comprehensive tool for evaluating risk of bias would improve overall strength of the review.

Background

• 1,440,000 pregnant women living with HIV worldwide
• HIV during pregnancy is associated with adverse maternal and fetal outcomes such as preterm birth, low birth weight, maternal and fetal death
• Interestingly, HIV is associated with a reduction in preeclampsia and other hypertensive disorders
• Preeclampsia is a serious complication of pregnancy that is a major cause of maternal death in developing countries

Research Question

Is there an association between highly active antiretroviral therapy and preeclampsia in HIV-positive pregnant women?

Methods

A structured literature review was conducted to determine whether there is a relationship between highly active antiretroviral therapy (HAART) and preeclampsia in HIV-positive pregnant women, and to examine possible implications of a relationship for women in developing countries.

Five major databases (MEDLINE, PubMed, Embase, Cochrane Central, and DARE) were searched using a predetermined search strategy (Figure 1) on March 18th, 2015. A flow diagram adapted from the PRISMA 2005 Flow Diagram was used to record the selection and screening process of articles for inclusion (Figure 2). A structured search strategy was used to identify relevant studies. Relevant articles were selected for inclusion if they met the following criteria: (1) population: HIV-infected pregnant women; (2) primary intervention or ancillary outcome: preeclampsia; (3) primary outcomes: preeclampsia, proteinuria, blood pressure; (4) comparison: HAART, placebo, no intervention; (5) study design: randomized controlled trials, cohort studies, case-control studies, cross-sectional studies.

Inclusion criteria:
1. Population: HIV-infected pregnant women
2. Interventions: HAART
3. Outcomes: preeclampsia
4. Study design: randomized controlled trials, cohort studies, case-control studies

Exclusion criteria:
1. HIV not reported
2. Non-English language
3. Patients not pregnant
4. No control group
5. No primary outcomes

Table 1. Data included from studies included for analysis

<table>
<thead>
<tr>
<th>Study, year</th>
<th>Title</th>
<th>Population</th>
<th>Study design</th>
<th>Comparison</th>
<th>Primary intervention</th>
<th>Primary outcome</th>
<th>Risk of bias assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boyajian et al., 2011</td>
<td>HAART and Preeclampsia</td>
<td>Pregnant women, Latin America</td>
<td>Cohort study</td>
<td>HAART</td>
<td>preeclampsia</td>
<td>May exist</td>
<td></td>
</tr>
<tr>
<td>Stankiewicz et al., 2002</td>
<td>HAART and Preeclampsia</td>
<td>Pregnant women, Botswana</td>
<td>Cohort study</td>
<td>HAART</td>
<td>preeclampsia</td>
<td>May exist</td>
<td></td>
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<tr>
<td>Hall et al., 2013</td>
<td>HAART and Preeclampsia</td>
<td>Pregnant women, England</td>
<td>Cohort study</td>
<td>HAART</td>
<td>preeclampsia</td>
<td>May exist</td>
<td></td>
</tr>
<tr>
<td>Segev et al., 2015</td>
<td>HAART and Preeclampsia</td>
<td>Pregnant women, Spain</td>
<td>Cohort study</td>
<td>HAART</td>
<td>preeclampsia</td>
<td>Yes, association exists</td>
<td></td>
</tr>
<tr>
<td>Hall et al., 2013</td>
<td>HAART and Preeclampsia</td>
<td>Pregnant women, London, England</td>
<td>Cohort study</td>
<td>HAART</td>
<td>preeclampsia</td>
<td>Yes, strong association</td>
<td></td>
</tr>
</tbody>
</table>

Results

The majority of the studies with low CASP scores were North American and European, and were published much earlier. These studies were done in developing regions. Selection bias: partially unavoidable, comparison groups were systematically different. Socioeconomic status was accounted for in only one study. HIV+ women in this review may not be representative of all HIV+ pregnant women. Measurement/classification bias: most studies relied on data from medical charts.

Discussion

Confounding bias: HIV+ women are less likely to have certain comorbidities. Therefore, differences in preeclampsia between HIV+ and HIV- women may be underestimated.

Limitations: search strategy. Did not specify comparisons. The review could be improved with a structured search strategy with inclusion and exclusion criteria. There is a need for further research.

Conclusions

The literature collected in this structured review does not provide sufficient evidence to formulate a concrete conclusion. However, it does wel in identifying gaps in the literature and informing future research. Studies agree that benefits of HAART in preventing MTCT of HIV far outweigh potential risk of preeclampsia associated with HAART, and that a restorative effect of HAART on the immune system may restore risk of preeclampsia to HIV baseline risk. More research is necessary to further elucidate associations between HAART and preeclampsia.

References

Boyajian, S., Affifi, S. D., Schollaert, B., & Boyajian, S. D. (2011). HIV during pregnancy is associated with adverse maternal and fetal outcomes such as preeclampsia, characterized by high blood pressure and proteinuria. Journal of Reproductive Medicine, 56(3), 137-144.