Reviewer’s report

Title: Serum lactate dehydrogenase profile as a retrospective indicator of uterine preparedness for labor: a prospective, observational study

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Reviewer: tekoa King

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This manuscript presents the findings of a study that assessed pre-birth and postpartum levels of aerobic and anaerobic profiles of serum LDH enzymes. The purported hypothesis is that women who are in active labor have a LDH profile that favors anaerobic metabolism to better produce ATP for uterine muscle contraction. The manuscript is well written, well organized, and the study was conducted with clear and appropriate methods. Both inclusion and exclusion criteria were well thought out and described clearly.

Previous studies that found the LDH profile changes during the course of pregnancy and labor includes small numbers of women and because they were conducted in the 1960-1970’s, obstetric practices may not be applicable to obstetric practice today. Therefore, this study consolidates and advances the knowledge of how LDH changes over the course of labor and it establishes a baseline for future work that could be of clinical value for the care of women in labor today.

I suggest the following revisions to improve reader comprehension:

Minor essential revisions:
1. The fifth paragraph of the background section appears to have a contradiction: The first sentence says total LDH serum levels are higher postpartum than prelabor. The last part of the paragraph states that total myometrial LDH declines from prelabor to postpartum. Can this be rewritten so the natural history of both myometrial and serum levels of LDH pre-labor to postpartum is stated more clearly?

2. Under limitations of the study: It would be helpful to state these findings may not be generalizable to a population that is more diverse racially and/or ethnically.

Discretionary revisions:
1. The final sentence in the fourth paragraph of the background states that it is believed LDH enzyme profile shifting occurs on a continuum through pregnancy and labor. I suggest the authors:
   a. State more explicitly that the natural history of LDH changes from pre-labor to postpartum is not known, nor is it known what the optimal percentage shift is for women in spontaneous active labor
b. Briefly introduce studies (Makkonen M 1982?) have assessed LDH changes over the course of labor.

c. Add a sentence at the conclusion of the introduction that describes why doing this in today’s obstetric environment now is of import.

2. Similarly, in the discussion section, it would aid reader understanding of the import of this work if text that reviews the following is included:

a. A more explicit description of the results of previous studies and more importantly, the probable differences in practice or missing data that disallow generalizing those studies to today’s clinical practice.

3. The statement in the discussion section that the “implications may be profound” is perhaps a bit too strong given this is relatively new work with an adequate but small number of women.

4. The discussion section suggests that obstetric interventions such as use of oxytocin augmentation may interrupt the time necessary for LDH profile shifting. A more clearly stated conclusion would be that the adverse consequences of use of oxytocin augmentation may be at least partially related to the fact that the uterine muscle isoenzyme environment is not yet optimized for uterine contraction activity when these interventions are implemented.

5. If the authors have the word space available, text that recommends reproducing this study with a larger more diverse population would be of value.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I declare that I have no competing interests