

Responses to comments

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MS TITLE: Associated factors and intrapartum management of the vaginal birth after cesarean section: a retrospective study.

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Responses to referee:

Reviewer 1

Generally comments: *Thank you for writing this manuscript. This subject consists a vital part in obstetric practice as the number of cesarean deliveries and their complications has increased dramatically worldwide.*

Response: We appreciate the positive comments from the reviewer.

Comment (1): *The title: In order to be more relevant to the work, It is advised to change the title into " Evaluation of factors that predict the success rate of trial of labor after the cesarean section"*

Responses: Thanks for the reviewer's suggestion, we have revised the title.

Comment (2): *Abstract: Aim of the study, methods and the are clear but could the conclusions answer the research proposal?*

Responses: We thank the reviewers' comments. The conclusion of the abstract has been revised (page 3 line 40-43 in the revised manuscript) and the abbreviations in the abstract were replaced.

Comment (3): *Background (Introduction): Approaching the subject was good, but I think the definition of TOLAC should be provided and what is the difference between it and the term VBAC. Please provide a reference for the statement in page 4 line 58-60.*

Responses: We provided definitions and references for TOLAC and VBAC (page 4 line 60-64 and Refs 7-9 in the revised manuscript).

Comment (4): *Methodology: In fact, some points in the inclusion and exclusion criteria on page 5 should be explained:*

Line 86: what is meant by normal pelvis?;

Line 88 : Uterine rupture during pregnancy? or you mean during previous delivery?;

Line 90 : Discontinuity of the anterior wall muscle layer of the lower uterus, how can this be confirmed? I prefer to use upper and lower uterine segment rather than lower uterus or uterine body statements.

Regarding the perinatal care: was the ANC given in the center of setting?

When the women were provided TOLAC and induction of labor was needed, what were the

methods used?

In Line 104-106 Please explain this statement or rewrite it in another expression " If the labor process of pregnant women progressed slowly, the indications for surgery such as emergency fetal distress, threatened uterine rupture or other indications for cesarean section were relaxed." and what is the timeline to consider labor as slowly progressed?

Responses: We are grateful for the reviewer's comments which will improve the quality of our paper significantly. The followings are the reply to the reviewer's concerns in this part.

Line 86: Since the size and shape of women's pelvis can affect delivery, these conditions are supposed to be determined before conducting TOLAC and concluded in the inclusion criteria. However, the expression we used was not appropriate and has been corrected as "pelvis with normal shape and size" in the revised manuscript (page 5 line 86).

Line 88: That indeed means the rupture of the uterus in a previous delivery. We have revised that (page 5 line 88).

Line 90: The suggestion of the reviewer has been followed (page 5 line 90).

Regarding to the antenatal care (ANC), all pregnant women were given full ANC throughout their pregnancy. We mentioned that in page 5, line 93-94 in the revised manuscript.

Immediate and appropriate measures are extremely important when induction of labor is needed after the failure of TOLAC. We added the expression of how to deal with this situation (page 6 line 103-107). We appreciate the suggestion of the reviewer.

Comment (5): *Statistical analysis: Opinion of a specialist in statistics need to be considered.*

Responses: There is a specialist in statistics among authors named Pengfei Qu. Recently, he also invited another expert to review all the data and the statistical analysis carefully.

Comment (6): *Results: The data presented in an appropriate way, tables and figures relevant and clearly presented and the overall results are not repetitive.*

Responses: We appreciate the positive comments from the reviewer.

Comment (7): *Discussion and conclusions: Discussion is exhaustive and informative but if possible to be shortened. I suggest moving paragraph on page 14 from lines 219-223 with the conclusions portion. In addition please provide recommendations part. Term of natural birth is better to be replaced by vaginal birth.*

Responses: Thanks for the comments. We have revised the Discussion section very carefully. Now the Discussion seems to reflect the interpretation of the research results more rigorously and comprehensively. We also replaced natural birth with vaginal birth throughout the article.

Comment (8): *References are preferred to be updated within the last 5 years, for example*

ACOG Practice bulletin no. 115: Vaginal birth after previous cesarean delivery. Obstet Gynecol 2010, 116:450-463. was recently updated as ACOG Practice Bulletin No. 205: Vaginal Birth After Cesarean Delivery Obstetrics & Gynecology: February 2019 - Volume 133 - Issue 2 - p e110-e127.

Also please provide the DOI of references whenever possible.

Responses: The Ref the reviewed mentioned is very important and we have updated it (Ref 7 in the revised manuscript). We also updated some references to make sure majority of them are within 5 years.

Reviewer 2

Generally comments: *The objective of this article is to identify and measure the influence of factors that affect vaginal delivery after cesarean section and to establish a model to predict the success rate of a trial of labor after cesarean section (TOLAC). The authors use data from a retrospective study in one hospital. They build a model using multiple regression analysis.*

Response: Thanks for the comments from the reviewer.

Comment (1): *The authors convincingly present the rationale of studying the determinants of TOLAC. TOLAC appears to be an important phenomenon to study to contribute to the decrease of CS rates, which is a public health issue. This topic is not new but may be part of a solution.*

Response: We appreciate the positive comments from the reviewer.

Comment (2): *The methodology is clearly stated. One point could be further detailed, regarding the absence of contraindication to vaginal trial among the inclusion criteria. What criteria does this include? In particular, do these criteria include the fetal lie that is one of the 6 criteria from Robson classification as are the duration of gestation weeks, the number of fetuses and the history of cesarean section also taken into account in the list of inclusion criteria?*

Responses: If there are contraindications of vaginal trial delivery, TOLAC is very likely to fail. According to the guidelines on indications and contraindications for VABC issued by the Chinese Obstetrics and Gynecology Science, this criteria included all the indicators the reviewer mentioned.

Comment (3): *The authors show the univariate logistic analysis of factors that predict successful TOLAC. Among them, the authors keep pregnancy BMI (for which $p = 0.017$) in the multivariate analysis but they do not keep the time interval from previous CS for which the p value is lower (0,014). This is in contradiction with the rule specified in the methodology according to which they would keep factors with $p < 0.05$. Can they document this choice?*

Responses: In this study, after the single-factor Logistic regression analysis, we performed the stepwise regression method of multi-factor Logistic regression to screen predictor variables. We screened out Parity and Pre-pregnancy BMI, Cervix Bishop score, Past vaginal delivery history

and neonatal birth weight were the five variables (P values are all less than 0.05). These five variables were finally used to construct the prediction model.

Comment (4): *In the multivariate logistic model, the authors do not introduce gravidity that has $p < 0.05$. Could the authors explain this choice?*

Gravidity could be introduced along with parity provided the authors take into account potential multicollinearity between those two variables and remedy to potential problems.

Responses: In this study, after the single-factor Logistic regression analysis, we also carried out the stepwise regression method of multi-factor Logistic regression to screen predictor variables. In the single factor Logistic regression analysis, the gravidity P value was 0.034. In the multivariate Logistic regression analysis, the gravidity P value was bigger than 0.05 and was excluded from the model.

Comment (5): *In the multivariate logistic regression model, parity and past vaginal delivery history are both introduced. These two factors are linked one with each other. The authors should solve this problem, which can be made by combining those two determinants together.*

Responses: In this study, the multi-factor logistic regression stepwise regression method was used to screen predictor variables. The stepwise regression method is also a method to solve multicollinearity. The multicollinearity among the selected five variables was low in our study. In the test of multicollinearity between the two variables, the VIF (variance expansion factor) was less than 5 and the correlation coefficients was less than 0.7. Therefore, these two variables can be put into the model at the same time for TOLAC prediction.

Comment (6): The English needs revision.

Responses: The English has been revised.