International Orthopaedics (2018) 42:449
https://doi.org/10.1007/s00264-017-3695-8

LETTER TO THE EDITOR

Comments on 'Potential risk factors for birth fractures: a case-control study'

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Received: 31 October 2017 / Accepted: 14 November 2017 / Published online: 27 November 2017

Dear editor,

We read with great interest the article by Ariyawatkul et al. [1]. After reading this article carefully and critically, we think that some methodological and statistical issues should be considered to avoid misinterpretation.

The authors mentioned that multiple analyses showed that the nurse attendant can be considered as an independent risk factor for birth fractures with an odds ratio (OR) (95% confidence interval [CI]) of 34.8 (3.03, 399.5); however, we think the effect of nurse attendants on birth fractures is overestimated due to sparse data bias. There are inadequate data for the combination of nurse attendant and birth fractures as there was only one participant in the control group with a nurse attendant. It is argued that in the presence of sparse data bias, the effect estimates such as OR would be biased and the degree of bias is more severe in the multiple analysis [2].

We re-analyzed the presented data in Table 4 of the article [1]. We found that in the univariate model the OR (95% CI) for effect of nurse attendant on birth fractures is 34.8 (3.03, 399.5). Here, we are wondering how the OR of nurse attendant is 34.8 in multiple analysis after adjusting other covariates. We re-estimated the effect of nurse attendant using penalization with data augmentation and found that the OR (95% CI) is 11.49 (1.59, 82.88); p-value=0.015 with log-F(2,2) prior.

Moreover, the authors included the predictor with p-value <0.05 in univariate analysis for multiple analysis. When highly significant predictors were to be included in multiple analysis, the effects of such predictors will be overestimated [3]. Such inflation of effect estimates is known as Testimation bias. To avoid this bias, a liberal *p*-value, e.g. 0.10 or 0.20, should be considered in univariate analysis [3]. Here, we recommend that predictor 'Delivery time' be considered for multiple analysis.

Acknowledgments This work was not supported by any organization.

Compliance with ethical standards

Conflict of interest None.

References

1. Ariyawatkul T, Worawuthangkul K, Chotigavanichaya C, Kaewpornsawan K, Chalayon O, Eamsobhana P (2017) Potential risk factors for birth fractures: a case-control study. Int Orthop 41(11):2361–2364. https://doi.org/10.1007/s00264-017-3600-5
2. Greenland S, Mansournia MA, Altman DG (2016) Sparse data bias: a problem hiding in plain sight. BMJ (Clinical Res Ed) 352:i1981. https://doi.org/10.1136/bmj.i1981
3. Steyerberg E (2008) Clinical prediction models: a practical approach to development, validation, and updating. Springer Science & Business Media, New York

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