Endocrine (2019) 65:221–222
https://doi.org/10.1007/s12020-019-01971-4

LETTER TO THE EDITOR

Check for updates

Reply to "Methodological issues in meta-analysis of the metformin effects on simple obesity"

Ning Hong-Hong[1] · Le Jiong[2] · Qin Shu-Lan[1]

Received: 21 April 2019 / Accepted: 24 May 2019 / Published online: 5 June 2019

To the Editor,

Dear Sir,

We thank Dr. Tian for his interest in our study.

We agree with the opinion of Dr. Tian that there are many limitations in the use of the fixed-effect model because heterogeneity was natural in the meta-analysis. However, some researchers thought that deciding mechanistically to give preference to a random-effect model in a meta-analysis was not desirable [1]. Eveline Nüesch et al. [2] also concluded that a meta-analysis based entirely on small trials should be implausible using the random-effect model.

In the study published by us, why we used the fixed-effect model was based on the following reasons. Firstly, the goal of the random-effect model is not to estimate one true effect, but to estimate the mean of a distribution of effects. As we move from the fixed effect to the random effect, extreme studies will lose influence if they are large, and will gain influence if they are small. As shown in Fig. 1, the weight of the study from Lim2009 included in our study is 98.4% when using the fixed-effect model. However, the weight drops to 53.7% when using the random-effect model. Secondly, a possible cause of small-study effects is clinical heterogeneity between patients in large and small studies. As heterogeneous in our study was large and the weight of one study included was 98.4%, there was the small-study effect in our study. The other researchers showed that random-effect model was truly more conservative than fixed-effect model only when the statistical heterogeneity was present and the small-study effect was absent [1]. Thirdly, although studies included are different sample sizes, the attribute weights are very similar when using the random-effect model. Therefore, the combined estimation obtained from the random-effect model may have a high deviation [3].

The selection of the pattern is based on the specific situation of the meta-analysis. Pooled estimates from the

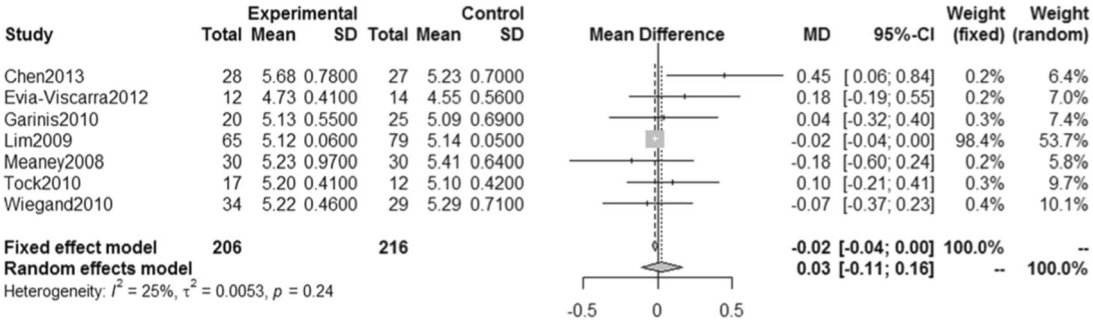

Fig. 1 Forest plot showing the fasting blood glucose at baseline comparing the metformin and control group based on fixed and random-effect model, respectively

✉ Qin Shu-Lan
qsl9995@aliyun.com

[1] Third Affiliated Hospital, Nanchang University, Nanchang 330008, China

[2] Jiangxi Aerospace Icloud Science and Technology Co., Ltd., Nanchang 330072, China

fixed-effect model are more conservative, and are closer to the line of no difference in the presence of small-study effect. Therefore, we used the fixed-effect model for summarizing the mean difference in our paper.

Funding This study was funded by the health and family planning commission of jiang-xi provincial for the research of science and technology (20171964).

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

References

1. B. R. Da Costa, P. Juni, Systematic reviews and meta-analyses of randomized trials: principles and pitfalls. Eur. Heart J. **35**(47), 3336–3345 (2014)
2. E. Nuesch, P. Juni, Commentary: Which meta-analyses are conclusive? Int. J. Epidemiol. **38**(1), 298–303 (2009)
3. M. Nazarzade, Z. Bidel, Meta-Analysis of Sleep Duration and Obesity in Children: Fixed Effect Model or Random Effect Model? J. Paediatr. Child Health **53**(9), 923–924 (2017)