



# Physical activity and risk of diabetic retinopathy: a risk assessment

Tomoyuki Kawada<sup>1</sup>

Received: 13 December 2019 / Accepted: 1 January 2020 / Published online: 6 February 2020  
© Springer-Verlag Italia S.r.l., part of Springer Nature 2020

Dear Editor,

I have read the research article “Physical activity and risk of diabetic retinopathy: a systematic review and meta-analysis” by Ren et al. [1]. The authors conducted a meta-analysis to investigate the effect of physical activity (PA) on diabetes mellitus (DM). Pooled risk ratios (RRs) (95% confidence intervals [CIs]) of physical activity (PA) for incident diabetic retinopathy (DR) and vision-threatening DR were 0.94 (0.90–0.98) and 0.89 (0.80–0.98), respectively. In addition, pooled RR (95% CI) of sedentary behavior for incident DR was 1.18 (1.01–1.37). I have some concerns about the study.

First, the authors evaluated the effect of moderate-intensity PA on the risk of DR, and pooled RR (95% CI) was 0.76 (0.58–1.00). The level of significance was marginal, which was inconsistent with significant dose–response relationship between increased PA and lower risk of DM [2]. DR is generally observed in patients with advanced DM, and progression of vascular damage by DM might not be protected by moderate-intensity PA. To verify the association, further studies are needed for the risk assessment by a meta-analysis.

Second, PA and sedentary behavior presented the opposite results for DR, which was logical and understandable. Relating to the methodology of PA detection, objective evaluation of PA might be important for preventing incident DR and its progression [3, 4].

Finally, Yaribeygi et al. [5] reported that aerobic exercise could prevent the development of diabetic complications, which was partly explained via attenuation of the major

molecular adverse effect by DM. Ren et al. [1] did not refer to the type of exercise, and molecular mechanism of suppressing inflammatory response and oxidative stress of retina by exercise should be verified by further studies.

## Compliance with ethical standards

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

**Human and animal Rights** This article does not contain any studies with human or animal subjects performed by the any of the authors.

**Informed consent** For this type of study, formal consent is not required.

## References

1. Ren C, Liu W, Li J, Cao Y, Xu J, Lu P (2019) Physical activity and risk of diabetic retinopathy: a systematic review and meta-analysis. *Acta Diabetol* 54:823–837
2. Martinez-Gomez D, Lavie CJ, Hamer M et al (2019) Physical activity without weight loss reduces the development of cardiovascular disease risk factors—a prospective cohort study of more than one hundred thousand adults. *Prog Cardiovasc Dis*. <https://doi.org/10.1016/j.pcad.2019.11.010>
3. Mitchell BL, Smith AE, Rowlands AV, Parfitt G, Dollman J (2018) Associations of physical activity and sedentary behaviour with metabolic syndrome in rural Australian adults. *J Sci Med Sport* 21:1232–1237
4. Dirani M, Crowston JG, van Wijngaarden P (2014) Physical inactivity as a risk factor for diabetic retinopathy? A review. *Clin Exp Ophthalmol* 42:574–581
5. Yaribeygi H, Butler AE, Sahebkar A (2019) Aerobic exercise can modulate the underlying mechanisms involved in the development of diabetic complications. *J Cell Physiol* 234:12508–12515

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Managed by Massimo Porta.

This comment refers to the article available at <https://doi.org/10.1007/s00592-019-01319-4>.

✉ Tomoyuki Kawada  
kawada@nms.ac.jp

<sup>1</sup> Department of Hygiene and Public Health, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-Ku, Tokyo 113-8602, Japan