PostScript

LETTERS

Incorrect statistical analysis: association among low whole blood viscosity, haematocrit, haemoglobin and diabetic retinopathy in subjects with type 2 diabetes

In the recently published study by Irace et al[1] the authors describe selecting two groups of individuals, one with and one without type 2 diabetes, the latter matched to the former with respect to age and sex. Although not explicitly stated, the authors have employed a matched case-control study design, which is appropriate. They further describe using unpaired t tests and logistic regression for their statistical analysis, neither of which are appropriate. This is attributed to the fact that neither accounts for the matched nature of the study design. The authors are strongly urged to conduct a reanalysis of their study data and provide readers with the appropriate measures of association and p values, amending their interpretations as warranted.

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REFERENCE
1. **Irace C,** Scarinci F, Scorcia V, et al. Association among low whole blood viscosity, haematocrit, haemoglobin and diabetic retinopathy in subjects with type 2 diabetes. Br J Ophthalmol 2011;**95**:94—8.

Authors' response

We thank Dr McGwin[1] for his comments regarding our recently published article on the association between blood viscosity, haemoglobin and diabetic retinopathy in subjects with type 2 diabetes mellitus.[2] As stated in the Methods section, we have enrolled 190 diabetic patients and 95 healthy controls matched for sex and age. Dr McGwin is therefore right when he underlines that the most powerful statistical test that can be used to compare variables between these two groups is the paired t test. All further analyses, however, were performed between groups of diabetic patients with different degrees of retinopathy: in these analyses the unpaired t test and logistic regression analysis were appropriate. Since the paired t test yielded results that are similar to those of the unpaired test and since the latter is more conservative, we decided not to use the paired t test also for comparison between patients and controls, thereby avoiding possible confusion for the reader. Based on this, we believe that the statistical approach used is acceptable and that the interpretation of results does not need to be changed.

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1. **McGwin G Jr.** Incorrect statistical analysis: association among low whole blood viscosity, haematocrit, haemoglobin and diabetic retinopathy in subjects with type 2 diabetes. Br J Ophthalmol 2011;**95**:1028.
2. **Irace C,** Scarinci F, Scorcia V, et al. Association among low whole blood viscosity, haematocrit, haemoglobin and diabetic retinopathy in subjects with type 2 diabetes. Br J Ophthalmol 2011;**95**:94—8.

Incorrect study design and analysis: visual acuity outcomes after deep anterior lamellar keratoplasty: a case-control study

The recently published study by Tan et al[1] is described as a retrospective case-control study; however, this is incorrect. The study participants were selected on the basis of an exposure of interest, that is, deep anterior lamellar keratoplasty versus penetrating keratoplasty and matched with respect to age, race and diagnosis. The study participants were followed (retrospectively) for the occurrence of visual and refractive outcomes as well as complications and graft survival. This describes a retrospective matched cohort study, not a retrospective case-control study. This error is not merely a semantic issue as it has implications for the appropriate statistical analysis and therefore the proper interpretation of the observed results. And, with respect to the current manuscript, not only is the statistical analysis incorrect for the study design the authors thought they used (ie, a retrospective case-control study), it is also incorrect for the study design they actually conducted (ie, a retrospective matched cohort study). With respect to the former, this is due to the fact that the analysis they actually conducted fails to account for the matched nature of the study design. With respect to the latter, by erroneously viewing theirs as a case-control study, they failed to conduct an analysis appropriate for matched cohort studies. Thus, the p values reported in the manuscript are incorrect on two accounts: they fail to account for the matched nature of the incorrect study design and they fail to account for the study design they actually employed. The authors are strongly urged to conduct a reanalysis of their study data and provide readers with appropriate measures of association and p values, amending their interpretations as warranted.

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REFERENCE
1. **Tan DT,** Anshu A, Parthasarathy A, et al. Visual acuity outcomes after deep anterior lamellar keratoplasty: a case-control study. Br J Ophthalmol 2010;**94**:1295—9.

Authors' response

We thank the editors and Dr Gerald McGwin Jr for their interest and comments with regard to the statistical methodology used in our paper.[1] Upon further statistical consultations, we concur that the study would indeed be best considered as a retrospective cohort study, as opposed to a case—control study. Our original intent was to perform frequency matching in comparing deep anterior lamellar keratoplasty (DALK) with penetrating keratoplasty (PK) groups, but

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