No competing interest

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Sir,

The influence of disease prevalence on screening for AMD

I read with interest the article by Jain *et al*[1] titled 'Screening for age-related macular degeneration using nonstereo digital photographs'. The authors found reasonably high sensitivities and specificities for detection of ARM and age-related macular degeneration (AMD) by graders viewing digital photos. While their results are not in question, I do raise objection to their discussion in which they state that the findings of the study might usefully be extended into a primary care setting. This assumption ignores a pivotal statistical fact and highlights why sensitivities and specificities alone do not tell the whole story when assessing how useful a screening test is.[2]

The setting of the study involved a contrived selection of cases from a retinal unit database. In this 'population', the prevalence of neovascular AMD was 31%. In a primary care setting, of course, the real prevalence will be much lower, say 2% in patients over 65 years. While this difference does not affect the sensitivity or specificity of the screening tool, it does impact very significantly on the positive predictive value.

In the study, for example, for grader 1, the sensitivity was 82.1% and the specificity was 79.7%. The positive predictive value can be calculated as 64.8% in the study 'population'. If the same sensitivity and specificity are applied to a primary care population, with an AMD prevalence of say 2%, the positive predictive value drops to 7.8%. This means that over 92% of positive results will actually be false positives.

This demonstrates that the utility of a screening tool cannot be evaluated without reference to the prevalence of the disease in the population in which it is to be used.

References

1 Jain S, Hamada S, Membrey WL, Chong V. Screening for age-related macular degeneration using nonstereo digital fundus photographs. *Eye* 2006; **20**: 471–475.
2 Altman DG, Bland JM. Statistics notes: diagnostic tests 2: predictive values. *BMJ* 1994; **309**: 102.

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Sir,

Reply to Mr Ali

We would like to thank Mr Ali for his interest in our article 'Screening for age-related macular degeneration using non stereo digital photographs'.[1] We agree with the obvious assertion that prevalence of a disease affects the utility of a screening tool by impacting on the positive predictive value.

However, we did not evaluate this technique as a general screening measure for people over a certain age but only for those with suspicious macular lesions that necessitated a retinal opinion. The 'contrived' database he refers to were patients referred to the retinal service by optometrists for exactly the above reason and these form our intended target population for telemedicine. In this selected group, we observed a high sensitivity and specificity of AMD detection.

We believe that this technique can significantly reduce the time between referral and appointment with a retinal specialist in patients with treatable CNV, which was the aim of the study in the first place.

Reference

1 Jain S, Hamada S, Membrey WL, Chong V. Screening for age-related macular degeneration using nonstereo digital fundus photographs. *Eye* 2006; **20**: 471–475.

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