

Additional thought concerning the glaucomas and systemic disease

Ian Murdoch

Dear Madam

Every so often in my somewhat random 'trawls' through the literature attempting to 'keep myself up to date', I come across a gem I encourage all interested in glaucoma to read. The paper by Wey and colleagues [1] is, in my opinion, one such gem. My reason for writing is to add one other thought to the interpretation of the literature so beautifully gathered and presented.

I wonder if we are better naming glaucoma with an s: glaucomas. By considering that we may have a group of diseases with a common endpoint, many of the negative findings in clinical trials might be explained simply because of poor case definition.

By way of example, if a person is colour blind, they might be unable to detect the difference between four different groups of coloured balls in a sample. Say these balls all had self-destruct mechanisms timed to reduce numbers by 10% each year. Table 1 below illustrates the effect after 5 years of two 100% effective interventions to prevent self-destruction for a particular colour.

It can be seen that, even though the treatment for colour 1 is 100% effective, our colour-blind observer will only see 90% effectivity. For colour 2, they will only see 69% effectivity. The implications of this are important for all studies on the glaucomas which may be underpowered until such a time as we can better phenotype.

Table 1 Example of colour ball survival at 5 years. The balls have a self-destruct mechanism destroying 10% per year. Totally effective interventions to prevent destruction in colour 1 and colour 2 are illustrated. The end column shows the overall impact of the intervention on the entire group to a colour-blind observer who is unable to distinguish between the ball colours

	Colour 1	Colour 2	Colour 3	Colour 4	Total as seen by colour-blind observer
<i>N</i>	700	100	100	100	1000
No treatment	459 (66%)	65 (65%)	65 (65%)	65 (65%)	654 (65%)
Treat colour 1	700 (100%)	65 (65%)	65 (65%)	65 (65%)	895 (90%)
Treat colour 2	459 (66%)	100 (100%)	65 (65%)	65 (65%)	689 (69%)

Reference

1. Wey S, Amanullah S, Spaeth GL, UstaogluM, Rahmatnejad K, Katz LJ (2019) Is primary open-angle glaucoma an ocular manifestation of systemic disease? *Graefes Arch.Clin Exp Ophth.* [https://doi.org/ 10.1007/s00417-019-04239-9](https://doi.org/10.1007/s00417-019-04239-9)