Research finds that the eye's optical quality deteriorates after alcohol consumption

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This is a night-time image seen with halos. Credit: UGRdivulga

A study conducted by the University of Granada has scientifically proven that alcohol consumption markedly impairs night-vision because it increases the perception of halos—luminous circles—and other visual night-time disturbances. Moreover, this deterioration of vision is significantly greater in subjects with breath alcohol content in excess of 0.25mg/litre—the legal limit for driving in Spain and other countries

and, also, that recommended by the World Health Organization (WHO).

Researchers from the Laboratory of Vision Sciences and Applications conclude that alcohol deteriorates the optical quality of the image we see because, among other things, it disturbs the tear-film that covers the surface of the eye. Essentially, this is because ethanol from alcoholic drinks passes into the tear and disturbs the outermost layer of the tear-film—the lipid layer—facilitating the evaporation of the aqueous part of the tear. In an eye with a deteriorated tear-film, the quality of the image that forms in the retina also deteriorates, as the study shows.

In a recently-published article in the international *Journal of Ophthalmology*, the authors evaluate retina-image quality and night-vision performance following alcohol consumption in a sample of 67 subjects. These volunteers had their breath alcohol content measured with an evidential breath-alcohol analyser, supplied by the traffic division of the Spanish Civil Guard in Granada. The participants consumed different quantities of a prize-winning wine from the Pago de Almaraes wineries, S.L. Benalúa de Guadix, Granada, winner of the International Challenge du Vin de Bordeaux.

"Halometer" measurements

To assess visual performance in low-illumination conditions, the researchers used a visual test known as a "halometer", developed in the Laboratory. This enabled them to quantify the level of night-vision disturbance in the form of, say, halos around bright lights, perceived by the subjects.

The results showed that following alcohol consumption, the perception of halos and other night-time visual disturbances increases and the optical quality of the image the eye produces deteriorates. This is more marked in subjects with a breath alcohol content level over the legal

limit for driving, that is, in excess of 0.25mg/l.

Principal author of the study,UGR lecturer José Juan Castro, explains that "this research offers results of value to society and public healthcare, especially in relation to night-time driving. Alcohol consumption and low-illumination conditions are factors present in many traffic accidents, hence people must to be made aware of the effects of alcohol consumption, especially on vision".

In fact, under these conditions, the perception of visual halos can make it difficult for drivers to see a pedestrian crossing the road, to distinguish a traffic sign, or they could be dazzled in some way by the headlights of another car coming towards them.

More information: Retinal-Image Quality and Night-Vision Performance after Alcohol Consumption, José J. Castro, Antonio M. Pozo, Manuel Rubiño, Rosario G. Anera and Luis Jiménez del Barco, *Journal of Ophthalmology*, Volume 2014, Article ID 704823, 7 pages, dx.doi.org/10.1155/2014/704823

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