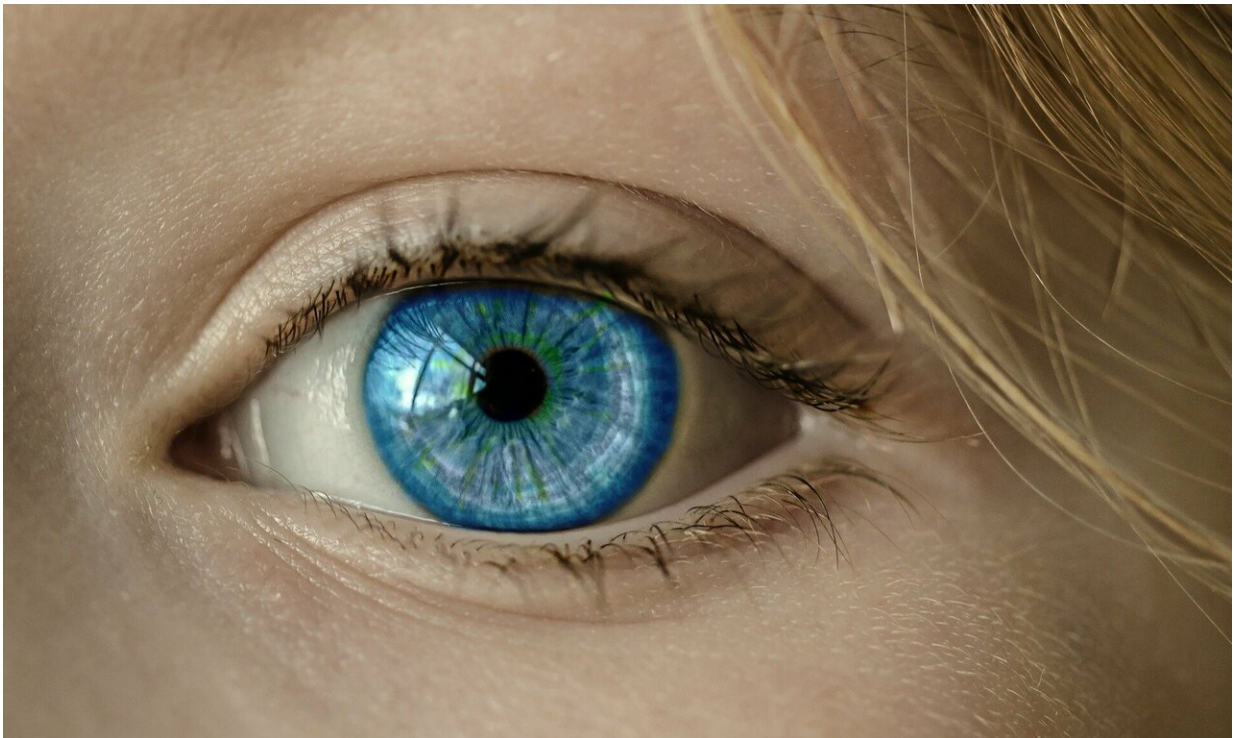


Poor nutrition can lead to sight loss in later life, according to study

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An unhealthy diet including high fat and cholesterol-enriched food can contribute to developing eye diseases which lead to a loss of vision, University of Southampton research has revealed.

The study, led by Dr. Arjuna Ratnayaka, has shown how [retinal pigment](#)

epithelial (RPE) cells in the eye become damaged due to poor nutrition, but also revealed a potential new treatment route through which these cells could be rescued before diseases such as [age-related macular degeneration](#) (AMD) develop.

AMD is an irreversible blinding disease caused by genetics and external factors such as smoking, high blood pressure or being overweight. It affects the central vision, which is used for reading and recognising faces and is a leading cause of sight loss in the UK – affecting more than 600,000 people.

How an [unhealthy diet](#) could increase the likelihood of [eye disease](#) is still poorly understood, therefore scientists analysed how disease-causing pathways triggered by poor nutrition could impact RPE cells.

Damage to RPE cells occur at the onset of AMD making them less equipped to support eye's photoreceptors, the cells in the retina which respond to light. The death of photoreceptors lead to permanent sight-loss.

The study determined how healthy RPE cells breakdown by-products generated by daily activities of photoreceptors through the cells' waste disposal system (which terminates in small vesicles called lysosomes).

Scientists found healthy RPE cells had a considerable degree of flexibility to cope with changing conditions in the aging eye, whereas a [high fat diet](#) can disrupt this breakdown process in RPE cells, thus causing long term damage and subsequently sight-loss.

Dr. Ratnayaka, Lecturer in Vision Sciences at the University, said:
"Although the effects of [poor nutrition](#) in eye health has been studied in large populations, how this actually brings about disease-causing changes in retinal cells is less well understood.

"We also found that some lysosomes appeared to remain undamaged even in such stressed RPE, suggesting an altogether new way in which damaged cells could be rescued to prevent eventual sight-loss.

"As our results showed how the waste disposal system of the RPE becomes damaged by unhealthy diet-driven disease pathways, our next step is to find out whether this type of damage can be reversed through better nutrition and if stressed or damaged RPE cells can possibly be rescued. Potential new therapies developed along these lines could offer new treatments for some AMD patients."

More information: Eloise Keeling et al. Oxidative Stress and Dysfunctional Intracellular Traffic Linked to an Unhealthy Diet Results in Impaired Cargo Transport in the Retinal Pigment Epithelium (RPE), *Molecular Nutrition & Food Research* (2019). [DOI: 10.1002/mnfr.201800951](https://doi.org/10.1002/mnfr.201800951)

Provided by University of Southampton

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