

Life Beyond Sight Loss

Introduction

The HVRT was fortunate enough to attend a captivating seminar organised by Blind Veterans UK and hosted by the Victory Services Club on the 24th May. The event boasted excellent speakers, coming from different areas of ocular research, including representatives from the United States collaborating with Blind Veterans UK on Project Gemini¹. The talks discussed topics from sight loss and traumatic brain injury to advances in military ocular care, with discussions on the newest advancements in trauma vision research.

The event began with Major General (Ret. Army Air Corps) Nick Caplin CB, Chief Executive of Blind Veterans UK, warmly welcoming the audience and introducing what was to be the first research seminar in a series, aiming to rediscover what drove the charity to be initially set up in 1915.

Speakers

The first speaker was Surgeon Vice Admiral Alasdair Walker, OBE, QHS, FRCS, British Defence Medical Services. He discussed the importance of vision trauma research to be conducted and communicated internationally in order to gain the most beneficial outcomes. The theme of vision trauma research was evident throughout the afternoon with speakers also reviewing veterans' rehabilitation, eye trauma, traumatic brain injuries and vision conditions.

Age-related macular degeneration

Dr Heidi Baseler, a lecturer at the Department of Psychology, University of York, gave a talk on neuroplasticity and vision loss. She presented an overview of her on-going research into how the brain responds to both sight loss and restoration. Since approximately half of the cases of blindness in the UK and US are caused by age-related macular degeneration (AMD)², Dr Baseler and her team studied the structure and function of the visual cortex in patients with AMD against healthy matched controls, using MRI and fMRI. They found that there was significant tissue loss and little brain function in the visual cortex, in patients with AMD, due to a lack of input into the brain from the eyes. They went on to investigate whether neuroplasticity in early years could protect against this loss of function. Indeed they found that in early vision loss, the brain was able to remap and reuse the visual cortex for other sensory processes such as touch. Clinically, these findings may potentially be harnessed to help the blind better navigate in their world. Currently the team are looking at how transcranial direct-current stimulation (tDCS)³ may help stimulate the visual cortex in order to prevent atrophy.

¹ Project Gemini is the annual exchange programme that brings together blind veterans from across three continents.

² Age-related macular degeneration (AMD) is an eye condition that causes a gradual loss of central vision.

³ Transcranial direct-current stimulation (tDCS) is a type of neurostimulation using constant, low level current to target a particular brain area.

Traumatic Brain Injury and Vision

Next Colonel (Ret. US Air Force) Dr Glenn Cockerham, MD, Stanford University, presented his work on traumatic brain injury (TBI) and sight loss. Visual quality of life was assessed in military personnel diagnosed with TBI and in participants diagnosed with one of the following conditions: cataracts, glaucoma, diabetes and multiple sclerosis (MS). Results revealed that the TBI group rated lowest on the quality of life scale, indicating poor self-perceived vision. Furthermore, while in common sight tests 91% of participants in this group passed with at least 20/40 vision, when subjected to harder sight tests, such as spatial contrast sensitivity tests and visual fields tests, only around 50% of military personnel, in this group, were classed with normal vision. This result also correlated with the severity of TBI, such that those with more severe TBI performed worse at these sight tests.

Innovation in Vision

Lt. Colonel Dr Kimberly Cockerham, MD FACS, at Stanford University, also discussed new technological advancements in vision research. Dr Cockerham introduced the audience to her innovative research on the development of a new, protective device that will deliver drugs directly to the body to protect and preserve its structure and function. She called it 'the ideal delivery system' since it will not only protect against a body part that has been recently damaged but also one that may be potentially injured. The device is very small at only a few millimetres and non-invasive to insert. Currently the research is moving into clinical trials where Dr Cockerham and her team intend to test how the device delivers Brominidine, a drug that has shown to reduce apoptosis of retinal ganglion cells (reduce cell death in the eye) and to provide neuroprotection. We are eagerly awaiting the results of the clinical trials.



Dr Heidi Baseler and Nick Caplin (CE of Blind Veterans)

Vision Research and Advances since WW1

Colonel (Ret. MC US Army) Dr Robert Mazzoli, MD FACS and Major (Ret. US Army) Dr Thomas Zampieri, PhD, spoke about what has been learned in the eye field since World War One. There was great emphasis placed on the necessity to change policies to ensure that eye shields are included in ambulances and medical kits to prevent further compression of injured eyes. Dr Mazzoli spoke of medical communication in mass-casualty incidents where ocular

injuries are common. He concluded that there is a need to integrate ophthalmology services into trauma teams and to improve long-distance coordination of medical care. Dr Zampieri discussed the importance of raising awareness of trauma vision research since approximately less than 1% of research funds in the UK are allocated to this field.

The seminar concluded with the panel answering questions from the audience on topics discussed throughout the afternoon.

We would like to thank Dr Renata Gomes and the team at Blind Veterans UK for organising such a compelling research event.



Panel Q&A: Dr Kimberly Cockerham, Dr Zampieri, Dr Mazzoili and Dr Glenn Cockerham