

SPORT AND CLINICAL OPTOMETRY

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There is a feeling abroad that Sports Vision is somehow different from mainstream optometry with nothing really to contribute to it. At every level, from routine refraction and orthoptic considerations to safety and the pathological, nothing could be further from the truth. Brian Ariel's article illustrates this point.

INTRODUCTION

Five articles about seemingly disparate phenomena have been published recently in the ophthalmic literature.

Some of the findings were that sports peoples' experiences, can help optometrists in their clinical skills and to give advice to patients who are interested in sport.

Five topics are discussed. Two of the conditions indicate possible pathology and referral, one condition suggests the avoidance of energetic sports, one advises active participation in sport and the last poses interesting clinical findings.

1. PIGMENTARY DISPERSION SYNDROME (PDS)

In PDS, iris granules are translocated throughout the anterior and posterior chambers of the eye including the trabecular meshwork. This condition, therefore, strongly predisposes the eye to glaucoma.

It is a bilateral disorder and has a strong hereditary link. It is also linked with myopia. The age of onset is typically between 20-40 years of age, often the time of life when vigorous sport is undertaken.

A number of studies imply that physical activity releases pigment into the trabecular meshwork, despite an open angle, which may raise the intra-ocular pressure ^(3,4)

Although it is generally considered beneficial in terms of health, those individuals with PDS have to be careful in choosing their sport. Patients with this condition are advised against participating in vigorous sports.

2. PULFRICH'S PHENOMENON

It was in the 19th century that this phenomenon was first described, and named after the scientist who first described it. It can be demonstrated to those with normal binocular vision if they look at a swinging pendulum while placing a filter in front of one eye.

The pendulum will appear to travel an elliptical course. It will appear to move clockwise with the filter in front of the left eye and anti-clockwise with the filter in front of the right eye.

The explanation for this effect is that the filter reduces the brightness and delays the impulse conduction from one eye only to the visual cortex and this creates an inter-ocular latency - the

provoked Pulfrich effect. Clinical interest is concerned with its spontaneous occurrence (the unprovoked Pulfrich Phenomenon), when patients may suffer distressing visual symptoms of spatial disorientation and difficulty in judging distances, especially with moving objects and/or, when they themselves are in motion ⁽⁵⁾.

For example, a task as simple as pouring boiling water into a cup may result in missing the cup entirely with severe injury. Or driving with resultant poor spatial perception, could have fatal consequences. (Most sports of course require good spatial awareness and depth perception - ED.)

The ocular causes can be unequal pupil sizes and opacities within the eye. If none of these are seen to exist then referral to a neuro-ophthalmologist is the best course of action since the cause could be the result of mid-facial trauma or multiple sclerosis. The effect can be nullified by the use of a tinted lens of the correct absorption in front of the least affected eye.

3. UHTHOFF'S SIGN

This is a phenomenon which was first noted and investigated in the 19th century by the founder of neuro-ophthalmology (whose name is given to the condition).

He linked a temporary visual loss or temporary blurred vision with exercise, heat, fatigue, anxiety or a combination of all.

There are documented instances of this visual failing occurring in a variety of sports. One basketball player developed the symptom after only 30 seconds play, while another person suffered it after jogging only 60 metres.

Generally, after the exercise ceases, normal vision returns, but occasionally obscured vision lasts for more than 18 hours.

In a recent study it was shown that within 3-5 years, patients with Uhthoffs Sign had a 53% incidence of multiple sclerosis (MS.). This is a disease where the myelin sheaths of the brain and spinal cord are damaged by a process of de-myelination. In Uhthoff's Symptom, it is a portion of the optic nerve that is the likely underlying cause. A presenting complaint it is seen as an important predictor of M.S.

Once again, if an optometric examination fails to find a cause, then referral is indicated. It is possible that the phrase 'to keep a cool head' has its origins in Uhthoffs Sign. Although 'warming up' is essential for sporting activity heating the body actually slows neural conduction thereby reducing sporting performance.

4. ARMD, CATARACT AND OCULAR SIGNS OF HYPERTENSION

ARMD is the leading cause of untreatable blindness in the western world while cataract is one of the leading causes of treatable blindness. Both are most frequently the result of the ageing process.

Coronary heart disease is a leading killer in many parts of the world. The modifiable risk factors in heart disease are hypertension, stress, diabetes, smoking, obesity, a poorly balanced diet and a sedentary life-style. Most important in decreasing damaging low density lipoproteins

(LDL), and increasing beneficial high density lipoproteins (HDL) is regular aerobic exercise.

Diet does not affect HDL levels to any extent but exercise and a better lifestyle does ⁽⁶⁾. LDL promotes the deposition of cholesterol on the walls of the arteries (atherosclerosis). Improving general health with regular exercise should improve ocular health. Elite sports people are generally healthy and are knowledgeable about the benefits of a good diet, vitamins, trace elements and anti-oxidants.

Anti-oxidants, which scavenge the free radicals and prevent tissue damage, may be present in a healthy diet but by taking regular exercise in conjunction with avoiding the risk factors outlined in heart disease, ARMD and cataract may be retarded or even prevented. Those patients who are at risk from any of these conditions should be advised accordingly.

5. DIFFERENT FORMS OF MONOCULAR OCCLUSION

When measuring monocular acuities it is customary to occlude one eye at a time. How the eye is occluded can give rise to a different acuity.

A black occluder will result in a lower acuity than a fogging lens or translucent occluder ⁽⁷⁾. Those who elect to close an eye often see better because the open eye takes on a narrower lid aperture simulating the pinhole effect.

In clinical practice if like is to be compared to like, then it becomes obvious that the type of occlusion should be recorded.

For years shooters and archers have used translucent occluders or small strips of black occlusion rather than closing an eye or using a black patch, explaining that they perform better in this fashion.

Closing an eye for long periods in competitive sport leads to ocular fatigue and a drop in performance. Using a black patch, as detailed above, yields inferior vision.



The reason that the translucent occluder is superior is that each eye receives almost equal amounts of light so that the pupils are almost the same size ⁽²⁾ and binocular summation can occur. Novices who engage in monocular sport should therefore be advised accordingly.

CONCLUSION

Optometrists are in a privileged position to help and listen to sports people and there are conditions which require clinical advice with particular sporting relevance.

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