Work Related Musculoskeletal Disorders in Ophthalmologists: A Silent Epidemic?

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Occupational injury and illness have been reported in health care workers in high rates, almost twice the reports from other service industries. The ophthalmic health care provider is at risk of developing work-related musculoskeletal disorders from exposure to ergonomic hazards of the working environment, inexpedient medical and surgical equipment design, awkward static postures, repetitive tasks, stress, and ever-present in the various postures adopted at work. A substantial volume of epidemiological research exists which provides a strong cause-effect relationship between high levels of exposure or simultaneous exposure to various ergonomic workplace hazards and the development of musculoskeletal disorders (MSD’s) in the workplace. However, not much data is available on the relationship between the magnitude of exposure and the severity of complications of MSD’s on ophthalmologists and optometrists.

Two unpublished surveys of 3700 ophthalmologists, one in the North East, and the other, nationally in USA reported a 66% and 85% incidence of work-related MSD. No single ophthalmic subspecialty had more problems and, no body site was more affected than others. The fact that only one third of ophthalmologists who received the survey questionnaire responded to it, pointed towards a lack of awareness of the occurrence of MSDs. It also brought out the fact that Ophthalmologists will have to scale a mountain of self-denial before addressing their own risks of becoming injured at work. However, once the risks are acknowledged, it is usually a simple matter to work differently to protect oneself or cope with a lingering work-related disability.

Routine ophthalmic practice involves excessive musculoskeletal workload in the cervicobrachial region. Performance of tasks which have a high level of “visual”, “manipulative” and “reach” demands on head neck and arms, results in increased muscular tension in the cervicobrachial muscle complexes. The problems are related to awkward static posture with upper cervical extension, lower cervical flexion, unsupported extremities, and a kyphotic hunched posture.

Thus the presentations of MSD in eye specialists are

**Upper Extremity Neuropathies**
- Carpal Tunnel Syndrome
- Ulnar Neuropathy
- Rotator Cuff Tendonitis and Shoulder Impingement

**Neck & Back:**
- Neck and back pain
- Radiculopathy
- Muscular and ligamentous injury
- Neural encroachment due to bulging herniated disc
- Degenerative Spondylolytic changes

Table-1 gives the results of a meta-analysis of 2 major surveys on prevalence and type of MSD in ophthalmologists.8,9
Aggravating factors reported in both these surveys included using the indirect ophthalmoscope, performing long operations and poor posture. The most common diagnosis included nonspecific muscle strain (25.8%), herniated disc (14.3%) and unknown (13.3%). 7.5% of the physicians required surgical treatment. Certain modification in the postures adopted at work has been suggested to reduce the strain on the cervicobrachial muscle complexes.

Ophthalmologists have been practicing since ages, and the common query is “Why are these problems cropping up now in epidemic proportions?”

The answer may be categorized as

1. The rise of the *Nintendo World* – that is an increase in the tasks done chiefly with the key board and VDU screens requiring finely controlled and repetitive motor skills.

2. Unergonomic equipment and design of workstation

3. Adoption of awkward posture at work.

4. An emphasis on productivity which demands more in a shorter time period.

5. Excessive job specialization making it necessary to repeat same jobs several times.


There is a greater strain on all ophthalmologists to see more number of patients at a faster rate. Imagine yourself sitting at the slit lamp for a prolonged period of time, seeing patients, one after the other, with your neck flexed or extended and your arms stretched beyond the safe ‘reach envelope’. Repetitive tasks can cause cumulative damage to your neck, back, shoulders and wrists. The risk for injury is further heightened when the risk factors are combined such as use of slit lamps, indirect ophthalmoscopic laser delivery systems and operating microscopes.

None of these injuries will occur over a short period of time. They are the result of cumulative insults accumulated over years of practice. Hence our goal should be to identify these activities and modify them while the practicing ophthalmologist is still early in his career.

Using electromyography, photography and computer modeling, “risky work patterns” in ophthalmic practice have been identified. These include

1. Slit lamp biomicroscopy
2. Slit lamp laser use.
3. Indirect Ophthalmoscopy (Surgery / OPD)
4. Indirect Ophthalmoscope laser delivery system
5. Operating Microscope use.

The correct posture to be adopted at work is detailed below:

At the slit lamp:
- Position the patient and slit lamp in such a way that your back stays straight.
- Your back should be supported by the chair back.
- Relax your shoulder and do not flex or extend your neck.
- Your arm should be supported and use an elbow rest made up of soft material (Foam padded material or viscoelastic surface).
- Using a standard pincer grip increases the pressure in the carpal tunnel. Use a pencil grip whenever possible.
- Avoid pronating your hand or forearm during gonioscopy. Avoid flexion of wrist.
- Relax your muscles and stretch your arms between patients and procedures.

While performing Indirect Ophthalmoscopy:
- Do not bend over. Elevate the patients’ chair so that you are comfortable.
- Limit neck flexion and sideways bending.
- Use an indirect ophthalmoscope with light weight fiberoptics to decrease the compressive and shear load on the discs of your neck.
- Support your hand on the patients’ head while performing scleral depression. (Fig. 2)

In the Operating Theatre:
- Use an ergonomic chair with a proper seat and back support as well as adjustable arm rest.
- Do not elevate and keep your shoulders abducted.
- Tuck your elbows gently into your sides to help support your arms.
- Position your wrist rest so that when you’re holding heavy hand pieces your wrist is not flexed.
- Reduce the duration of awkward postures involved in vitreoretinal surgery by staging procedures. Be aware that problems can occur while performing fine precise movements while using the pincer grip, prolonged seated posture, holding a vitreous cutter or scissors for prolonged periods and having to exert force against a cryoprobes’s stiff cord.

Adjust the OT table to an optimal height so that your back and arms are supported and your back and neck aren’t bent. The ideal sitting posture includes an anteriorly tilted pelvis, maintenance of lumbar lordosis,
neutral thoracic kyphosis, lower cervical lordosis and upper cervical kyphosis. With correct posture muscle tension is reduced and compressive loads are more evenly distributed throughout the spine, away from weaker posterior structures (Fig. 3).

In The Office
You should adjust your work station so that at work you have adequate back support, horizontal thighs and vertical lower legs. Your feet should rest on the floor or on a foot rest. While working in the computer your wrists should be supported and in a neutral position (Fig. 4). These minimal modifications suggested in the work posture will certainly go a long way in reducing incidence of work related musculoskeletal disorders.

This article demonstrates the common ergonomic risk factors seen in ordinary ophthalmic practice and the cumulative consequence of improper posture on the musculoskeletal system. Modification of these factors could definitely reduce the risk of musculoskeletal disorders. In addition, consultation with a physical therapist to learn quick and simple exercises that can be performed in between surgeries or patient examination in what is termed *working out at work* will also prove very useful.

It has been stated that an epidemic of cervical spine disease is looming over the nations’ eye professionals. If we’re aware of the existence of such a disease entity and are willing to try out modifications in our work posture, rest assured that – we’re well protected!
References


