

Study Shows Injuries Occur Frequently From Soft Lenses With High Water Content*

Investigations in Japan have shown that many high water content soft lens wearers suffer from injury during a short period of wearing time, and that doctors must be very careful in prescribing these lenses and in assuring after-care.

The study, by Hikaru Hamano, M.D., and others of the Department of Ophthalmology, Osaka University Medical School, was based on wearing tests made on human and rabbit eyes and compared with results using ordinary soft lenses.

In explaining the results, Dr. Hamano stressed that "the water in high water content soft lenses evaporates easily. If the water supply through tearing cannot compensate for the amount of evaporation, tears between the cornea and the lens are absorbed into the lens and the normal clearance cannot be kept constant."

In the extreme case, he observed, there is even a possibility that the water will be absorbed in the epithelial cells. This could injure the epithelial layer.

Another possible explanation for lens injury is the considerable variation of base curve or deformation of the lens due to evaporation, he explained. "This would give the dynamic force to the cornea and the movement of the soft lens by blinking would be suppressed. This would prohibit tear exchange."

In order to ensure the applicability of high water content soft lenses for extended continuous wear, it is necessary to ascertain that they are safer than the ordinary soft lens on wearing at least half a day, Dr. Hamano commented. One of his studies included examinations of the cornea and conjunctiva by slit lamp every two hours of both eyes of 10 subjects who had not worn contact lenses. An ordinary soft lens with 30 percent water content was applied to one eye, and a high water content soft lens containing 65 percent water

on the other eye.

"In the high water content soft lens, some kind of injury was recognized after two hours of wearing in five eyes," he stressed. "During six hours of wearing, staining was recognized in seven of the 10 eyes."

In a similar experiment conducted with high water content soft lenses containing 70 percent water, staining was seen on six out of 10 eyes, he reported. "In contrast, with ordinary soft lenses containing 30 percent water, slight staining was seen on only two lenses, after two and six hours."

Because high water content soft lenses produce injury more frequently, this implies that they produce more risk than the ordinary soft lens, Dr. Hamano commented.

The typical epithelial abrasion induced by wearing of high water content soft lenses is apt to occur in the wide region from the central or negative zone to the peripheral zone of the cornea, he said. "Irregularity is induced on the epithelial layer of cornea and epithelial edema can be recognized partly. Thus as a whole, complex morphology is realized."

Calling the high water content lens "superb from the standpoint of physical properties," Dr. Hamano noted that "it seems there are some elements which would have a negative effect on the physiology of the cornea." To elucidate those elements he conducted several other experiments.

In one study he examined the weight loss of soft lenses of the same thickness containing 30 percent and 65 percent water and subjected them to atmospheric evaporation under the same conditions. The high water content soft lens dried more quickly, with 62.7 percent of the water evaporating within 30 minutes. Evaporation was 50.8 percent in the ordinary soft lens.

The amount of evaporation was not as great in tests conducted on human eyes due to the tear supply. The high water content lens showed a much higher degree of evapora-

tion, however.

In measuring deviation of base curve with the time of wearing soft lenses of the same thickness by an electronic device, Dr. Hamano found that as the water evaporated from the lens, the base curve became smaller. The high water content soft lens showed a larger deviation.

"Recently many people have shown a great deal of interest in continuous wearing of high water content soft lenses with good oxygen permeability," Dr. Hamano observed, "Continuous wearing is what we have been longing for as an ideal status. We cannot deny the fact, however, that there remain many problems in the safe application of high water content soft lenses."

Australia Loses. . . (cont'd. from p. 15)

sions; acceptance of a philosophy of professionalism and its increasing embodiment in statutory controls and everyday mode of practice; extension of influence and concern by Australian optometry to optometry elsewhere through involvement with IOOL, the sponsorship of IFAPAO and the provision of clinical aid teams to underprivileged countries; up-grading of undergraduate education in optometry; promotion of continuing education as an integral part of professional life; improvement of neglected areas of optometric endeavour such as low vision and children's vision; development of significant AOA member services such as malpractice insurance, travel services, directories and clinical manuals, low-cost practice insurance; achievement of deserved self-respect and pride among optometrists as primary care practitioners and the institution of effective communication channels between all levels of optometry.

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