LENS EXERCISE AS A TREATMENT OF MYOPIA

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Formerly it was believed that most myopia was of an axial nature, i.e., a result of lengthening of the antero-posterior diameter of the eyeball, so that parallel rays focussed in front of the retina. While axial lengthening of the eyeball is undoubtedly the cause of myopia of high degree (the so-called progressive or malignant myopia), yet development of myopia of slight degree (the so-called school myopia or benign) can be explained better on another basis.

School myopia must be a lens myopia. In the case of prolonged eye strain, such as produced by continuous attention on minute objects, the ciliary muscle is maintained in a state of contraction; finally a spasmodic condition makes its appearance, which then causes the lens to be in a state of increased convexity. This "spasmodic convexity" was found to be the primary or acute condition producing school myopia. With increasing age the lens gradually loses its inherent elasticity, and the lens becomes less capable of correcting its convexity even if the ciliary muscle were released from its spasmodic condition. This "inelastic convexity" is the secondary or chronic condition for the production of school myopia. It is for this reason that the acute spastic convexity can be relaxed easily by atropine, but the secondary inelastic convexity can not.

There is much evidence to support this theory. Statistically, the distribution of the refraction of the new born shows a "normal variability curve" or "probability curve", with a slightly hyperopic point as the mode. This curve changes its form noticeably in the school age period, in which the slopes of the curve are much steeper, with the apex at the emmetropic point. This phenomenon is called emmetropization or centralization of the refraction. The problem arises as to how this emmetropization is brought about. The refraction curve of patients after cataract extraction provides the answer.
The distribution regains the form of the normal variability curve, with +11D as the mode. Therefore the mechanism of the emmetropization must lie in the lens itself.

Upon instillation of atropine into the eyes of school children the emmetropization decreases and the curve shifts towards the hyperopic side. Nevertheless, much of the tendency toward emmetropization persists even with atropine and the curve is still asymmetrical. The explanation lies in the reversibility of the spasm of the ciliary muscle by atropine, but not of the secondarily fixed state of the lens, so that the original form of the curve is only partially restored.

If the school myopia becomes chronic because of decreased elasticity of the lens, it should be possible to improve it by means of gymnastic training just as the elasticity of other parts of the body is increased by exercise.

METHOD: Take two test types. Set one of them (Snellen's No. 10) at the far point, or preferably, slightly beyond the far point; set the other test type (smallest of the ordinary printer's type) at the near point, or somewhat nearer than this point. When the far point of the patient is or becomes farther than 10 feet, shorten it by using a convex lens of suitable strength.

Let the patient accommodate alternately for the two test types. A rate of alternation of eight cycles per minute is satisfactory. Continue for 15 minutes for each treatment, three treatments a day.

RESULTS: Of 34 myopic eyes from 17 cases (2 nurses, 15 middle school boys and girls), 13 eyes became hyperopic, 3 eyes emmetropic, 10 eyes decidedly improved (visual acuity without glasses more than doubled), and 8 eyes mildly improved. No case was without benefit.

In the most effective case the acuteness of vision improved from 10/20 to 15/10 and the refraction from -1.0D to +1.25D, corresponding to a reduction of the convexity of the lens of 2.25D.

The recovery persisted during a three month follow-up period.

THE INTRAPERITONEAL INOCULATION OF
BCG-VACCINE IN INFANTS

BY YOSHIRO YAMAOKA AND KEIZABURO OKAYASU

BCG-vaccine as a tuberculosis preventive has recently become very popular in Japan. The axillary method of BCG-inoculation which was introduced in 1944 by Takahasi in Manchuria, is superior to the intracutaneous and subcutaneous methods in the following respects: (1) it shows no disagreeable local phenomena, (2) the change to a positive Mantoux reaction occurs in nearly 100 per cent of cases. As a result, the utilization of