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LETTER TO THE EDITOR

PINEAL EFFECT ON LONGEVITY

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A RECENT study of survivorship among the blind in Massachusetts [1] reveals that blind persons under 65 suffering from retrolental fibroplasia had a significantly better survivorship than other blind individuals. This may be the result of a pineal effect upon longevity.

Ten year survival rates for major affections in the Massachusetts study (see Table 1) reveal that blind males under 65 with retrolental fibroplasia had a 96% observed survival. The expected survival of the general population in the same age group, calculated from State Life Tables and weighted according to age distribution within the blind group, was 98% [2]. The blind category with the next closest observed to expected survivorship, affections of the cornea, had 76% observed survival as opposed to 86% expected survival. The difference between the survival of the retrolental fibroplasia group and the corneal affections group was highly significant ($p < 0.005$); the former had a survivorship not significantly different from the general population, while the survivorship of the latter was much worse than that of the general population.

The ten year survival picture for females under 65 was similar. Blind women with retrolental fibroplasia had a 99% observed survival and a 98% expected survival. The female group with the next closest observed to expected survivorship, myopia, had an 87% observed and 91% expected survival. The difference between the survival of the retrolental fibroplasia group and the myopia group was significant ($p < 0.025$).

The blind have long been known to have substantially poorer survival rates than sighted groups at all ages up to 75 [1, 3, 4]. For besides suffering the complications of systemic diseases, such as diabetes, which often lead to loss of vision, the blind are especially prone to accidents. This accounts for the very poor survivorship seen in most of the blind groups.

However, in retrolental fibroplasia, affections of the cornea, and myopia, there is no significant association of life-shortening systemic diseases. And although all three

TABLE 1 (FROM [1]). TEN YEAR SURVIVAL RATES FOR BLIND PERSONS (OBSERVED) COMPARED WITH THE GENERAL POPULATION (EXPECTED) BY MAJOR CAUSE OF BLINDNESS AND SEX FOR PERSONS UNDER AGE 65

	Males			Females		
Major affection	No. of cases	% Obs.	% Exp.	No. of cases	% Obs.	% Exp.
Glaucoma	196	66	80	219	66	88
Myopia	155	72	87	191	87	91
Affections of cornea	115	76	86	126	81	92
Cataract	301	72	87	343	67	91
Uveitis	162	72	89	177	74	92
Retinal degenerations	815	56	88	857	47	89
Retrolental fibroplasia	222	96	98	205	99	98
Affections of optic nerve	458	70	90	269	65	94
Other	150	80	95	116	80	96
Unknown site	378	62	92	310	53	93

forms of blindness would seem to have the same risk of death from accidents, the retrolental fibroplasia group still has a significantly better survivorship than the other two groups. This increased survivorship, though not exceeding that of the general population, is quite remarkable, since it is obviously reduced by the high incidence of accidents and other causes of death peculiar to the blind but not a result of associated systemic disease. There are three reasons for believing that a pineal effect on longevity may be the explanation for this increased survivorship in retrolental fibroplasia.

First, blindness and absence of light stimulation are known to affect markedly both pineal morphology and function. The weight of the pineal is increased in animals raised in darkness. The blinding of rats causes gonadal atrophy on account of a pineal effect; and the chemistry of the pineal is also altered by blindness [5, 6].

Second, in the entire list of major affections analyzed in the Massachusetts study, retrolental fibroplasia produces the greatest incidence of total blindness—that is, no light perception. In an individual study of retrolental fibroplasia in schoolchildren, of 926 cases 45% had no light perception [7]. This may be compared with 3.2% of 2,542 cases added to the Massachusetts register in 1977 who were totally blind [8]. And almost total blindness is required to produce a pineal effect. The pineal, through its photoreceptor, the eye, is extremely sensitive to light. As little as 0.5 $\mu W/cm^2$ of full spectrum white light can inhibit the usual dark time rise in pineal *N*-acetyltransferase activity. Retrolental fibroplasia, moreover, would cause quite a long period of total blindness, since loss of vision almost invariably occurs within the first few weeks of life.

Third, mammalian longevity is now believed to be regulated by a biological clock [9], and recent studies of both mammals and sparrows have implicated the pineal as the location of just such a clock [5].

If the pineal is proven to have an effect on longevity, it would not be unique in this respect. For Wodinsky has recently shown the longevity of the female octopus to be controlled by optic gland secretion [10]. A pineal effect on longevity will, of course, be difficult to verify experimentally in man, but studies of other mammals may provide new and interesting insights into this problem.

Steven Lehrer, M.D.
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