FERTILITY AND STERILITY
Vol. 38, No. 6, December 1982
Printed in U.S.A.

Fertility of blind women

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Light and light-dark cycles have a marked effect in regulating the reproductive cycles of some mammals. During long nights and short days or after blinding, gonadal atrophy will occur in the Syrian Golden hamster, *Mesocricetus auratus*. This phenomenon has been shown to be mediated by stimulation of the pineal gland.[1] Moreover, the light-dark cycle may have a similar endocrine effect in human beings under certain circumstances. For example, in northern Finland most conceptions occur during the summer.[2]

However, a preliminary study of blind women indicated that blindness seems to have no long-term effect on fertility.[3] The present study includes data from the preliminary study as well as additional data gathered since that time.

MATERIALS AND METHODS

The new data in the present study were obtained by a questionnaire printed in large type and braille (National Braille Press, Boston, MA), sent in three mailings, separated by 1-month intervals, to alumnae of the Perkins School for the Blind, Watertown, MA; and by a questionnaire, printed in large type, administered to clients of the Nevil Institute for Rehabilitation and Service, Philadelphia, PA.

Data from the preliminary study were obtained by a questionnaire printed in large type and sent in one mailing to the following: (1) alumnae of the Western Pennsylvania School for Blind Children, Pittsburgh; (2) alumnae of the Maryland School for the Blind, Baltimore; (3) alumnae of the Indiana School for the Blind, Indianapolis; and (4) users of the Andrew Woods Sensory Assistance Center, United States Department of Justice, Washington, DC. All subjects were Caucasian and in good health during their reproductive years.

RESULTS

The results of this study are tabulated in Table 1. Two hundred twenty questionnaires were sent out, and 55 were returned completed. Since the subjects were not required to identify themselves, one may safely assume that the data are reasonably representative of the entire population to which questionnaires were sent.

Of the subjects without light perception, 12 of 14 who attempted to become pregnant were able to do so. Only 2 of the 14 were infertile.

Of the subjects with light perception, 15 of 15 who attempted to become pregnant were able to do so. None was infertile. There was no significant difference, in those women who tried to become pregnant, between subjects with and without light perception ($\chi^2 = 0.61$, with Yates' correction; $P = 0.55$).

One subject with light perception and one subject without light perception said they were diabetic. Both had delivered normal children.

The preliminary study indicated that there might be some correlation between age at loss of light perception and age at menopause. There was no such correlation evident in the larger sample here of 14 women past menopause with no light perception ($r = 0.1$; $P > 0.2$).

Received July 27, 1982; revised and accepted August 11, 1982.

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Table 1. *Fertility and Reproductive Data on Blind Women in This Study*

	Light perception	No light perception
No. of subjects	24	31
Age at blindness (yrs)	5.4 ± 8.5	3.3 ± 5.3
Age at loss of light perception (yrs)	—	8.4 ± 12.1
Age at menarche (yrs)	12.4 ± 2.0	12.4 ± 1.44
Age today	57.5 ± 17.5	51.9 ± 19.2
Age at menopause[a]	49.0 ± 3.5	49.4 ± 2.9
Menstrual period length (days)	4.98 ± 1.44	4.3 ± 1.2
Menstrual cycle length (days)	27.85 ± 2.25	28.15 ± 2.3
No. of subjects pregnant	15	12
No. of subjects infertile	0	2
No. of pregnancies[b]	2.0 ± 0.93	2.73 ± 1.7
No. of live births[b]	1.7 ± 0.8	2.1 ± 1.3
No. of miscarriages[b]	0.2 ± 0.6	0.8 ± 1.3

[a]Fourteen women without light perception and 15 women with light perception were past menopause.

[b]In those subjects who tried to become pregnant.

DISCUSSION

A widely cited piece of evidence for the presence of a pineal effect on the fertility of human beings is the study of Elden.[4] He reported in 1969 that only one woman blind since birth became pregnant and delivered a normal child in the state of Washington; this woman had no light perception. On the basis of the birth rate and the blind population, there should have been 120 such women. In the United States in the same year, only 6 pregnancies in blind women were reported, when over 1000 should have been expected. From this data and other anecdotal evidence, Elden concluded that blindness caused infertility in women.

However, Elden did not take into account the degree of light perception of all the subjects in his study, an important consideration, since the pineal 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.[5] Consequently, one would expect that only those women without light perception should show a pineal effect on fertility; in the present study they represent 56% of the sample, but in the blind population as a whole, only about 3% of persons have no light perception.[6]

Further, the gonadal atrophy in hamsters resulting from short days and long nights lasts only a few weeks, followed by a spontaneous recrudescence, possibly due to an increasing insensitivity of pineal target tissues.[7] Consequently, a woman blind from early childhood might not be expected to be infertile throughout her entire reproductive life.

Therefore, one may conclude from the data presented here that blindness probably has little or no effect on the long-term fertility of women.

Acknowledgments. I am grateful to Mrs. Grace Toth and Mr. Thomas P. Duffy, Jr., of the Perkins School for the Blind Alumni Association, and to Mr. Charles Woodcock and Mr. Kevin Lessard of the Perkins School for the Blind, Watertown, MA; Mrs. Janice Knuth of the Nevil Institute for Rehabilitation and Service, Philadelphia, PA; Mr. Joseph Wassermann of the Western Pennsylvania School for Blind Children, Pittsburgh, PA; Dr. Richard L. Welsh of the Maryland School for the Blind, Baltimore, MD; Mr. Frank Andrews of the Indiana School for the Blind Alumni Association, Indianapolis, IN; and Ms. Candice Aviles of the United States Department of Justice, Washington, D.C. I also wish to thank Mrs. Elaine Wodicka, Mrs. Virginia Leavy, and Dr. Bernard Roswit of the Veterans Administration Hospital, Bronx, NY, for their help, support, and encouragement.

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