

treated in the short-term psychiatric unit and that a more liberal attitude regarding such admissions might be adopted.

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CORNEAL SCARRING IN
CANADIAN ESKIMOS

HOWARD REED, M.B., M.S.,
F.R.C.S.(Eng. and C.)* and J. A. HILDES,
M.D., M.R.C.P.(Lond.), F.R.C.P.[C],†
Winnipeg, Man.

DURING a survey in the Eastern Arctic conducted by the Indian and Northern Health Services an incidence of 9.3% of eye disease was found in Eskimos.¹ This was made up of all types of eye diseases and included a considerable number of cases of corneal scarring. Similar findings were noted on the Eastern Arctic Survey of 1957.² Also in 1957, 18.7% of the Eskimos examined in the Central Arctic by Dr. Van den Berg were found to have eye diseases.³ Corneal scarring formed a high proportion of these lesions.

Some observers have suggested that these corneal opacities might be due to riboflavin and other vitamin deficiencies⁴ and to ultraviolet light injury.⁵ However, ophthalmologists who have studied the problem in Alaska considered phlyctenular keratoconjunctivitis to be the chief cause. Barnett *et al.*⁶ found the incidence to be as high as 20-50% in some Alaskan native villages. Thygeson and Fritz^{7, 8} examined 1050 Alaskan Eskimos and Indians in 1949 and 1950 in schools and hospitals and found 28% with active or inactive phlyctenulosis.

In a recent Canadian report, Duggan and Hatfield⁹ reviewed the findings in 467 Indians and Eskimos in the Charles Camsell Indian Hospital, Edmonton, which serves north-western Canada. There was a 17.2% incidence of phlyctenular keratitis but the incidence of active cases was less than 1%.

*Departments of Ophthalmology, University of Manitoba and Winnipeg Clinic.

†Defence Research Board Arctic Medical Research Unit, Department of Physiology and Medical Research, University of Manitoba.

RÉSUMÉ

Les auteurs ont étudié un groupe de 54 malades âgés de 60 ans et plus admis au département de psychiatrie d'un hôpital général en 1957. Selon leur diagnostic et leur pronostic ces malades furent classifiés dans l'une des cinq catégories basées sur une symptomatologie affective, psycho-neurotique, organique, délirante ou schizophrène. Ils furent revus six mois après que le dernier d'entre eux eut reçu son congé. Cette étude a montré que la présence de lésions de dégénérescence cérébrale est le facteur qui détermine le pronostic et la survie. La fréquence des désordres fonctionnels réversibles fut beaucoup plus élevée que celle des psychoses organiques. Le pronostic des désordres affectifs est meilleur que celui des psychonévroses. Après un séjour d'une moyenne de 29 jours, 41 d'entre eux (76%) étaient suffisamment améliorés pour recevoir leur congé et 34 (63%) participaient de façon satisfaisante aux activités de la collectivité, alors que 7 (13%) étaient morts. D'après ces chiffres il semble qu'un plus grand nombre de vieillards pourraient recevoir des soins psychiatriques de courte durée et partant, l'admission de ces malades aux cliniques psychiatriques devrait être rendue plus facile.

In an attempt to assess the incidence and causes of corneal scarring in the Central Arctic, arrangements were made with the Indian and Northern Health Services to survey the situation there. A preliminary survey of Eskimos in Brandon Sanatorium was undertaken in May 1958, and in August one of us (H.R.) joined the Central Arctic Medical Survey on the Hudson's Bay Company supply ship "Rupertsland". Three settlements on the west coast of Hudson Bay were visited: Eskimo Point, Chesterfield Inlet and Rankin Inlet.

The eyes of all Eskimos available in these communities were examined clinically. The corneæ and conjunctivæ were carefully inspected, the pupillary reactions tested and the fundi examined. Corneal defects were examined with a loupe. No slit lamp was available. If any defect of the lens or fundi was seen, the pupils were dilated for more thorough examination. In the majority of Eskimos over the age of 40 the intraocular tension was determined with a Schiotz tonometer. In addition, the visual acuity of the patients in Brandon Sanatorium was tested with the illiterate E chart.

RESULTS

Table I shows the number of Eskimos examined at the three ports of call and at Brandon Sanatorium. These totalled 503, of whom four had active

TABLE I.—INCIDENCE OF EYE DISEASE IN ESKIMOS

Location	No. examined	No. with phlyctenular scarring	No. with probable herpetic corneal scars	No. with other eye diseases
Eskimo Point	132	9	0	20
Chesterfield Inlet	75	5	1	4
Rankin Inlet	198	13	4	4
Brandon Sanatorium	98	8	1	12
Total	503	35	6	40

TABLE II.—SERIOUS VISUAL DEFECTS FROM CORNEAL SCARS

Location	One eye	Both eyes	Herpetic scarring	
			One eye	Both eyes
Eskimo Point	1			
Chesterfield Inlet	1			
Rankin Inlet	2	1*	3	
Brandon Sanatorium	3	2*	1	

*The patient at Rankin Inlet and one of the patients at Brandon Sanatorium had severe acute phlyctenular keratoconjunctivitis.

phlyctenular keratitis and 31 had corneal scars considered due to old phlyctenular disease, giving an incidence of 7%. An additional six of the Eskimos had corneal scarring which resembled that due to herpetic keratitis.

The incidence of serious visual defects with vision reduced to less than 20/200 resulting from phlyctenulosis in one or both eyes is shown in Table II. In three cases both eyes were seriously affected; in seven others there was a serious defect in one eye only. Four of the cases of herpetic scarring had serious monocular visual defects.

Forty Eskimos had other ocular lesions such as squints, cataracts and pterygia; there were a few congenital anomalies, an occasional case of iritis and choroiditis and some cases of old eye injury (Table III).

TABLE III.—OTHER EYE DISEASES

Disease	No.
Pterygia	8
Cataracts	3
Iritis scarring	2
Congenital anomalies	3
Nystagmus	1
Bilateral absolute glaucoma	1
Old choroiditis	1
Choroidal sclerosis	2
Squint	4
Eye injuries	6
Conjunctivitis	4
Faint non-specific corneal nebulæ	8*
Total	43†

*Probably more cases of faint nebulæ would have been detected with a slit lamp and microscope, and their etiology would have been more obvious.

†In a few cases a patient had more than one disease.

Few Eskimos are sure of their age, so this was estimated. The intraocular tension was measured in 37 Eskimos who were considered to be over 40 years of age. It was raised above 25 mm. Hg in only one old woman at Eskimo Point who was totally blind with bilateral absolute glaucoma. In addition, 16 patients at Brandon Sanatorium had significant refractive errors.

DISCUSSION

Although the overall incidence of all eye diseases found in the present survey is similar to that reported in 1957,³ the incidence of phlyctenular scarring was less than that found in Alaska. However, faint corneal nebulæ are not observed in casual examination. Thygeson⁸ used a slit lamp

and corneal microscope and he emphasized that many faint nebulæ can only be seen this way. This makes strict comparisons difficult. There is no doubt that if a slit lamp and binocular microscope had been used during this survey, a higher incidence would have been found.

It is not possible to prove that corneal scars are in fact due to phlyctenular disease in any given case. But the presence of active cases, the reports of similar studies elsewhere in the Arctic, and the appearance of the corneal scars are, we feel, adequate evidence for the assumption that phlyctenulosis is responsible for the corneal scarring in the great majority of cases.

The degree of disability resulting from phlyctenular scars is not severe. Fritz *et al.*⁷ found only 19 individuals out of more than 400 in whom the best eye had less than 20/70 vision. Of the 35 cases seen in the present survey, only three had vision seriously affected in both eyes (Table II).

Four acute cases were seen. Two of these were in Brandon Sanatorium, one at Rankin Inlet and the other at Eskimo Point. The differential diagnosis between acute phlyctenular disease and acute herpetic keratitis is important and practical, as it has been shown that antibodies to herpes simplex virus are prevalent in Eastern Arctic Eskimos.¹⁰ Phlyctenular keratoconjunctivitis is more common and it is usually bilateral. It should be treated by instilling cortisone or hydrocortisone ointment into the eyes every three hours. Herpetic keratitis is almost always unilateral and is usually accompanied by an upper respiratory infection. Herpetic keratitis must never be treated with cortisone, which aggravates the condition.

The prevention of new cases of phlyctenular disease is related to the treatment of tuberculosis. In his authoritative study on the etiology of phlyctenular ophthalmia, Sorsby¹¹ concluded that the disease is a manifestation of tuberculous infection and that the phlycten makes its appearance only in the presence of a hyperallergic phase and of an exciting factor of endogenous or exogenous origin.

The incidence of tuberculosis in Eskimos is very high. There are 12,000 Canadian Eskimos, and nearly one in five of these has been or is in sanatoria for tuberculosis.¹² This is in keeping with a high incidence of phlyctenulosis. However, the present program of the Indian and Northern Health Services includes regular annual surveys of Eskimos in all areas of the Canadian Arctic. General physical examination and chest radiography are carried out in an attempt to diagnose active tuberculosis cases early, so that they may be sent to sanatoria for treatment. This program has reduced the mortality rate from tuberculosis. The Health Services are also concerned with measures for improving sanitation, nutrition and living conditions. It is our belief that the present annual surveys are the most effective means available for combating tuberculosis and thus reducing the incidence of phlyctenular keratoconjunctivitis.

SUMMARY

The results of this survey indicate that:

1. Phlyctenular keratoconjunctivitis is the most important cause of corneal scarring in Eskimos.
2. The number of cases with disability resulting from this disease does not constitute a serious health problem.
3. Since phlyctenular keratitis is due to a tuberculo-protein allergic reaction in the great majority of cases, the present annual surveys in the Western, Central and Eastern Arctic Regions to detect tuberculosis and the provision of sanatorium care are the most useful means of combating this disease.

We are grateful to Dr. P. E. Moore, Director of the Indian and Northern Health Services, Department of National Health and Welfare, for his co-operation, and to Dr. W. J. Wood, Regional Director, who organized the survey. The expenses were defrayed by the Indian and Northern Health Services.

TUBERCULIN SURVEY OF THE POPULATION OF MANITOULIN ISLAND*

STEFAN GRZYBOWSKI, M.D., M.R.C.P.(Lond.)
and ZYGMUNT DUNAJ, M.D., Toronto

IN THE PAST it was generally believed that tuberculin testing should be confined to the years of childhood. There seemed no point in tuberculin testing adults because practically all were infected. This is no longer true; we know that at present adults may go through life without acquiring tuberculous infection. These considerations stimulated ideas of utilizing tuberculin testing in mass surveys and other tuberculosis control programs. The Department of Health of Ontario decided therefore to apply tuberculin testing on a community basis, and Manitoulin Island was chosen for the first pilot study of this kind. Analysis of the findings of this survey are presented here.

METHODS

Tuberculin testing was carried out at the time of the mass radiological survey, both positive and negative reactors over the age of 12 years being examined. Persons of all ages were tested. No. 1 dilution of old tuberculin (5 tuberculin units; 1/20 mg.) prepared by the Connaught Medical Research Laboratories was used. The results were read 48 to 96 hours later. An induration of at least 5 mm. in diameter was considered a positive reaction. Testing was carried out by registered nurses trained and supervised by

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RÉSUMÉ

Une enquête a montré que la kérato-conjonctivite phlycténaire est la cause la plus fréquente de cicatrice cornéenne chez les Esquimaux. Le nombre de cas ne constitue pas cependant un problème sanitaire important. Puisque la plupart du temps la kératite phlycténaire est causée une réaction allergique à une tuberculo-protéine, les enquêtes annuelles menées dans les régions arctiques du pays pour le dépistage de la tuberculose ainsi que le traitement au sanatorium, constituent les meilleurs moyens d'enrayer cette maladie.

physicians from the Ontario Department of Health. Results of the tests were recorded on special cards, which included information relating to country of birth, racial origin, occupation and previous vaccination with B.C.G.

RESULTS

Participation in Tuberculin Survey:

In the preparatory discussions on the integration of tuberculin testing into tuberculosis case-finding programs, fears were expressed that the use of injections would scare off many potential participants. In order to study this point, the participation of the population of Manitoulin Island in this combined tuberculin and radiological survey was compared with that of previous surveys. This comparison is shown in Table I.

Thus, in spite of the use of tuberculin testing the participation of the public has increased by 13% over the last survey in which miniature x-ray films alone were used. It will be appreciated that this comparison is based only on that part of the population which is suitable for radiological examination. Introduction of tuberculin testing into the survey has extended coverage to all age groups. Inclusion of children in the survey is probably the important reason for the increased

TABLE I.—PARTICIPATION IN SURVEYS

	1950	1953	1955	1957
Estimated population over 15 years of age (suitable for radiological examination)	9363	9543	9711	9200
Number of radiographs taken	4086	4057	4879	5834
Percentage coverage	43.6	42.5	50.2	63.4