S.L.E. syndrome (Wilske *et al.*, 1965) is demonstrably immunosuppressive in vivo (Sorrel *et al.*, 1971).

We can hypothesize that practolol, by selectively inactivating T-lymphocyte populations which normally control the emergence of lymphocytes with autoimmune propensities (Allison *et al.*, 1971), thereby triggers the S.L.E. syndrome. Further studies will be needed to test this idea.

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Australia (Hepatitis-Associated) Antigen in Patients Attending a Venereal Disease Clinic

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Summary

A total of 1,650 patients attending the venereal disease department at St. Mary's Hospital, London, have been tested for Australia antigen. Twenty-three positive results were obtained, or 1.39%, which is more than 10 times the rate noted by others in blood donor populations in the U.K. and U.S.A. The positive rates among female patients and European male heterosexual patients were 0.36% and 0.19% respectively. High rates were obtained for homosexual patients (3.8%) and non-European heterosexual patients (3.1%). The reasons for the higher rates found in these groups merit further study.

Introduction

On present evidence, any person carrying Australia antigen must be regarded as potentially infectious. While it may not be possible to screen all hospital admissions for carriage of the antigen it is surely important to recognize certain "high risk" groups of patients, particularly if the hospital incorporates a haemodialysis or renal transplant unit. Most of the published figures for Australia antigen carriage refer to blood donor populations, and there is some evidence that the rate is higher among hospital admissions (Lous *et al.*, 1970).

Narcotic addicts (Nordenfelt *et al.*, 1970; Hunter *et al.*, 1971) and commercial blood donors (Cherubin and Prince, 1971) are examples of recognized "high risk" groups,

and there is a rapidly increasing amount of data showing high carriage rates in countries outside the U.S.A. and western Europe.

We present the results of a preliminary survey of patients attending a large venereal disease clinic.

Patients and Methods

Serum specimens which had previously been investigated serologically for venereal disease were tested for Australia antigen by the techniques of immunoelectro-osmophoresis (Pesendorfer *et al.*, 1970) and gel diffusion (Ouchterlony). A rabbit antiserum to Australia antigen (Behring) was used in both systems.

Before testing, the sera had been inactivated at 56°C for 30 minutes for the Wassermann reaction test. All positive results for Australia antigen were confirmed by testing unheated serum. A total of 1,650 sera were examined in the preliminary survey, and follow-up tests of specimens were carried out on several of the patients found to be carrying the antigen.

Results

Of the 1,650 patients, 1,097 were men and 553 were women. Twenty-three of them (21 men and two women) were positive for Australia antigen, giving an overall rate of 1.39% (table I). We were impressed by the fact that 12 of the positive male patients were homosexuals (table II). Further analysis shows a grouping of positive patients into two main categories—European homosexuals (11/282) and non-European heterosexuals (8/259) (table III). The positive rate among European heterosexuals and female patients is not significantly different from results of surveys on other European populations (Lous *et al.*, 1970).

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TABLE I—Details of Australia Antigen-Positive Patients

Case No.	Age	Sex	Country of Origin	Homosexual or Heterosexual	Diagnosis at Time of Test	Comments
1	23	M.	U.K.	Homosexual	Secondary syphilis	Operation for renal stone six weeks before testing (? details)
2	26	M.	Egypt	Heterosexual	Non-specific urethritis	
3	44	M.	West Indies	Heterosexual	Latent syphilis	This patient's flat-mate had "jaundice" in 1971—patient has never been jaundiced
4	39	M.	U.K.	Homosexual	Proctitis	
5	36	M.	U.K.	Homosexual	Check-up. No abnormality	
6	26	M.	Iran	Heterosexual	Non-specific urethritis	
7	36	M.	U.K.	Homosexual	Gonorrhoea	
8	30	M.	U.S.S.R.	Heterosexual	Non-specific urethritis	Patient arrived from St. Lucia less than two weeks before testing
9	26	M.	U.K.	Homosexual	Gonorrhoea	
10	24	M.	Guyana	Heterosexual	Non-specific urethritis	
11	42	M.	U.K.	Homosexual	Proctitis	
12	28	M.	Germany	Homosexual	Check-up. No abnormality	
13	20	M.	Eire	Homosexual	Proctitis	
14	23	M.	U.K.	Homosexual	Proctitis	
15	28	M.	West Indies	Heterosexual	Syphilis contact. No abnormality	
16	24	M.	France	Homosexual	Proctitis	
17	22	M.	Iran	Heterosexual	Gonorrhoea	
18	32	M.	Tunisia	Heterosexual	Scabies	
19	22	M.	U.K.	Homosexual	Non-specific urethritis	
20	26	M.	Jamaica	Homosexual and heterosexual	Check-up. No abnormality	
21	31	M.	St. Lucia	Heterosexual	Non-specific urethritis	
22	37	F.	Granada	Heterosexual	Check-up. No abnormality	
23	25	F.	U.K.	Heterosexual	Vaginitis	

TABLE II—Male Patients Tested for Australia Antigen

	Number	Homosexuals	Percent. Homosexuals
Positive cases	21	12	57.1
Negative cases	1,076	306	28.4
Total	1,097	318	29

TABLE III—Analysis of Positive Results

	Sera Tested	Positive	Percent. Positive
Male homosexual (European)	282	11	3.9
Male homosexual (non-European)	36	1	—
Male heterosexual (European)	520	1	0.19
Male heterosexual (non-European)	259	8	3.1
Female	553	2	0.36
Total	1,650	23	1.39

We intend performing further studies on the positive patients and hope to present the results in the future. Further sera have been obtained on 10 of the patients, and all remained positive at a period of one to three months after initial testing. One (case 19) was known to be negative for Australia antigen five weeks before the result shown. He apparently remained well in the period between these tests.

Discussion

Immunoelectro-osmophoresis and immunodiffusion may not be as sensitive as some of the newer techniques for Australia antigen testing. However, as many of the screening surveys have been performed using these techniques, one should be able to compare the above results with those of other series.

The carriage rate of Australia antigen in healthy blood donors in the U.S.A. and U.K. has been estimated at about 0.1% (Lous *et al.*, 1970; Wallace *et al.*, 1972). The rate is very much higher than this in some other countries (Cossart, 1972); the carriage rate among hospital admissions in Copenhagen was 0.34% (Cherubin *et al.*, 1971). The high rate of 1.39% in the present series is mainly due to two groups of men—non-European heterosexuals and European homosexuals.

We have little information as to duration of residence of the patients in the U.K., but we suggest that the rate of 3.1% in non-European heterosexuals may be due to transient visitors to this country.

It is interesting to speculate as to the reasons for the 3.9% positive rate in European homosexuals. Vahrman (1970) suggested the possibility of venereal transmission of long-incubation hepatitis in homosexuals. One of the commonest presenting conditions among the homosexuals in this survey was proctitis. Also many of them appear repeatedly with genital and skin sores, and transmission may well occur through these skin and mucous membrane lesions. The possibility of oral spread of Australia antigen by blood and serous exudates must be considered. Krugmann and Giles (1970) (in the Willowbrook studies) described non-parenteral transmission of hepatitis B.

The relatively low incidence of positive Australia antigen among the female patients would argue against venereal spread in the heterosexual sense. It is possible that Australia antigen may be passed around within localized groups of homosexuals. In a number of series, the Australia antigen carriage rate has been significantly higher in men than in women, and it is tempting to suggest that homosexuality contributes to this.

In this survey we have identified a group of homosexuals with a significantly raised incidence of Australia antigen. If our results are confirmed by other workers it would be interesting to attempt to discover the reasons for this. In the meantime it seems clear that homosexuals are a potentially "high risk" group of patients.

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