by cysts does not normally occur, although it may be produced under extremely artificial conditions.

9195

Value of Mouse Brain Antigen for Diagnosis of Lymphogranuloma Inguinale.

EMMERICH VON HAAM AND RALPH HARTWELL.

From the Departments of Pathology and Bacteriology, Louisiana State University Medical Center, and the State Charity Hospital of Louisiana, New Orleans.

D'Aunoy and von Haam[1] reported the results of a series of Frei tests performed in 547 cases of lymphogranuloma inguinale and 1,132 negro hospital patients suffering from various other diseases. The diagnoses based upon the test proved correct in 90.9% of the cases, in 7.2% the patients gave doubtful reactions and in 1.9% apparently faulty reactions were obtained. A comparison of the various antigens used for the Frei test showed that antigen prepared from human glands and the brains of experimentally infected marmosets gave less doubtful reactions than the antigen prepared from diluted human pus or brain emulsions of infected mice.

Strauss and Howard[2] published the results of Frei tests on 14 persons which included 8 healthy controls, 5 definite cases of lymphogranuloma inguinale and one questionable case. They claimed that nearly half of the reactions to mouse brain antigen injected intradermally into normal subjects were indistinguishable from typical positive Frei reactions. These false reactions were ascribed by the authors to unknown changes which occur in infected mouse brain antigens within a few weeks after preparation. For this reason, the authors believe that Frei antigen made from mouse brain is unsuitable for the routine diagnosis of lymphogranuloma inguinale.

Grace and Suskind,[3] testing 95 specimens of their own lymphogranulomatous mouse brain antigens and 41 specimens of commercial mouse brain antigen in 50 cases of lymphogranuloma inguinale and 128 persons who served as control, denied the occurrence of any changes which would make the antigen unreliable for the performance of the Frei test, within a period of 2 years after preparation.

---

1 D'Aunoy, R., and von Haam, E., *Am. J. Clin. Path.*, 1936, **6**, 529.

2 Strauss, M. J., and Howard, M. E., *J. A. M. A.*, 1936, **106**, 517.

3 Grace, A. W., and Suskind. F. H., *J. A. M. A.*, 1936, **107**, 1359.

Because of the widespread interest that lymphogranuloma inguinale has recently aroused in the United States and the recognized value of the Frei test for the diagnosis of the disease, the question as to the value of the antigen used in the test is of extreme importance. In our own laboratory, mouse brain antigens have been prepared for the last 4 years at regular monthly intervals from various strains of lymphogranuloma inguinale virus and have produced very satisfactory results. Because of its quick method of preparation and standardization it has largely replaced antigens prepared from human material or from the brains of infected marmosets in our diagnostic and therapeutic work.

We have made a systematic study of the influence of age upon the specificity and the sensitivity of mouse brain antigen (M.B.A.). Small samples of each monthly-prepared portion of our antigen were preserved in a sealed vial either in the ice-box or in a desk drawer at room temperature and at the beginning of our experiments we had antigen available which was anywhere from one month to 14 months old. Antigen prepared from human material and control antigen prepared from normal mouse brain emulsions were likewise kept for over one year, under both conditions, and tested for diagnostic value. With this material, the sterility of which was frequently tested, Frei tests were performed in the usual manner and the reactions obtained were compared with tests performed on the same individuals with fresh human or mouse brain antigen. Five persons showing the clinical symptoms of acute lymphogranuloma inguinale and 68 healthy medical students who gave no allergic history were subjected to those tests, and the results are listed in Tables I, II, and III.

From the results shown in the tables we may conclude that neither the specificity nor the sensitivity of mouse brain antigen is greatly affected by ageing of the antigen up to 14 months. Out of a total of 177 reactions observed within a short time on 68 noninfected per-

TABLE I.
Frei Tests with M.B. Antigen Aged in the Ice-Box.
Medical Students.

Reaction	Age of M.B. Antigen in Months 14	12	10	8	7	5	4	2	1	Total No.
Negative up to 2 mm. diameter	37	5	6	4	4	8	5	2	6	77
Doubtful Negative 3-4 mm. diam.	8	4	3	2	2	0	4	2	3	28
Weakly Positive 5-6 diam.	2	0	0	0	0	0	0	4	0	6
Positive over 7 mm. diam.	0	0	0	0	0	0	0	1	0	1

TABLE II.
Frei Tests with M.B. Antigen Aged at Room Temperature.
Medical Students

Reaction	Age of M.B. Antigen in Months 14	12	10	9	8	7	5	1	Total No.
Negative									
up to 2 mm. diameter	6	2	15	7	5	5	6	8	54
Doubtful Negative									
3-4 mm. diam.	0	3	3	2	1	1	0	1	11
Weakly Positive									
5-6 mm. diam.	0	0	0	0	0	0	0	0	0
Positive									
over 7 mm. diam.	0	0	0	0	0	0	0	0	0

TABLE III.
Frei Tests with Old Antigen in Cases of Lymphogranuloma Inguinale.
Five Patients.

Type of Antigen	Age in Months	Reaction
Infected Mouse Brain	12, 10, 8, 7, 1	Strongly Positive
" Human Glands	12	Weakly "
Normal Mouse Brain	10, 1	Negative

sons, 74% gave reactions not larger than 2 mm. in diameter while in only 4% was the papule produced by the antigen larger than 4 mm. Control antigen prepared from the brain emulsions of normal mice and kept for 10 months under similar conditions likewise failed to produce papules larger than 4 mm. in diameter. A comparison of Tables I and II seems to indicate that ice-box temperature is not absolutely necessary to keep the antigens specific, provided their sterility is assured. From Table III we learn that old antigens maintain their reactivity for at least 14 months. Only the human antigen gave slightly weaker positive reactions after having been kept for one year in the ice-box. Although the number of patients with lymphogranuloma inguinale on whom the effectiveness of the old antigens was tested is not very large, we believe that the uniformity of the results in our cases is sufficient proof that the diagnostic value of mouse brain antigen is not altered by keeping the antigen in the ice-box or at room temperature for as long as one year.

The results of our investigation confirm the findings of Grace and Suskind. Without attempting to explain the contrary results of Strauss and Howard, we wish to stress some of the factors which seem of special importance in conducting the tests. The sterility of the antigen must be absolutely assured, the injection must be made in the superficial layers of the epithelium and the papules produced should not be larger than 10 mm. in diameter. Only persons in whom the presence of an allergic status has been excluded should

be used as normal control subjects. We agree with the New Haven workers that mouse brain emulsions will often produce strong reactions in allergic persons, but these reactions will be equally as severe following the injection of normal mouse brain emulsion as following the injection of specific mouse brain antigen. Therefore, we use normal mouse brain emulsions as control instead of sterile saline solutions, as first advocated by Frei.[4] A comparison of both reactions will then insure the correct diagnosis in persons with slight allergic reactions. This has also been advocated by Grace and Suskind.

Summary. On the basis of 217 Frei tests performed in persons suffering from acute lymphogranuloma inguinale and healthy medical students, with mouse brain antigen of varying age, we conclude that neither its specificity nor its sensitivity is altered by preservation in the ice-box or at room temperature, for as long as 14 months. In order to exclude false positive reactions in persons hypersensitive to mouse brain emulsions, the use of normal mouse brain emulsions as control is recommended.

9196 P

Effect of Posture on Cardiac Output.

H. MORROW SWEENEY AND H. S. MAYERSON.

From the Laboratory of Physiology, School of Medicine, Tulane University, New Orleans.

Most of the evidence obtained by various investigators employing different methods shows that cardiac output is decreased progressively in the sitting and standing as contrasted to the recumbent position. Recent investigations[1-5] in which the generally accepted more accurate acetylene method was used have given results in the same direction. Grollman,[6] however, using a nitrous oxide method which in his hands gave values agreeing with the acetylene method, found no change with posture. Beilschowsky,[7] using the acetylene method,

4 Frei, W., *Klin. Wchnschr.*, 1925, **4**, 2148.

1 Fisher, I. L., *Arbeitsphysiologie*, 1932-3, **6**, 111.

2 Bock, H., *Zeit. f. d. ges. exper. Med.*, 1934, **92**, 782.

3 Nylin, G., *Skand. Arch. f. Physiol.*, 1934, **69**, 237.

4 Schneider, E. C., and Crampton, C. B., *Am. J. Physiol.*, 1934, **110**, 14.

5 Scott, J. C., *Am. J. Physiol.*, 1936, **115**, 268.

6 Grollman, A., *Am. J. Physiol.*, 1928, **86**, 285.

7 Beilschowsky, P., *Klin. Woch.*, 1932, **2**, 1252.