JOURNAL OF THE FACULTY OF MEDICINE — BAGHDAD

COMPARATIVE ETIOLOGICAL FACTORS OF ACUTE INFECTIOUS POLYNEURITIS IN IRAQ AND AUSTRIA

Tariq I. Hamdi and F. Gerstenbrand

REPRINTED FROM THE JOURNAL OF THE FACULTY OF MEDICINE
Volume 7 (New Series) No. 3-4 July - October, 1965
BAGHDAD • IRAQ

J. FAC. MED. BAGHDAD (1965)
VOL. 7 (N.S.) NO. 3-4.

COMPARATIVE ETIOLOGICAL FACTORS OF ACUTE INFECTIOUS POLYNEURITIS IN IRAQ AND AUSTRIA

Tariq I. Hamdi and F. Gerstenbrand

(Department of Medicine, College of Medicine, University of Baghdad, Baghdad, Iraq, and the Neuro-Psychiatric Clinic, University of Vienna, Vienna, Austria).

INTRODUCTION

Of diseases of the lower motor neurones, acute infectious polyneuritis is of particular interest. It is characterised by typical flaccid paralysis of an ascending type, with or without sensory disturbances and involvement of cranial nerves. A significant laboratory finding is the albumino-cytologic dissociation in the cerebrospinal fluid. The disease may take several courses. In addition to the typical Guillain-Barré form, there may be exhibited an abortive, acute, amyotrophic-like or a Landry form. Moreover, apart from the usual type of spinal localisation with or without respiratory complications, a spino-cephalic form with involvement of the various cranial nerves may be observed. DeJong (1940) differentiated three courses of the disease: an acute form with full remission; a severe type with residual paralysis; and a lethal type with bulbar affection.

The present study is an analysis of patients with this disease in Iraq and those in Austria. This comparison permits some conclusions in regard to aetiologic factors and the influence of environment.

MATERIAL IN IRAQ

The study includes twenty patients admitted to the Republican Hospital, Baghdad, during the past 3 years. Their ages ranged from 12-50 years, with a mean of 23 years. All came from the southern part of Iraq, mostly from rural districts. They were either farmers or manual workers; 17 were male and 3 female. All were admitted during spring or autumn seasons. Onset was acute in all patients, and a prodromal fever was noted in 80% of them.

One patient had an attack of herpes zoster two weeks before the neuritis developed. Another had an attack in association with anaphylactoid purpura, and two were allergic, as evidenced by recurrent bouts of urticaria. Two had a history of chronic tonsillitis. The previous history of the remaining 14 patients was negative, but it is quite common for people

in southern Iraq to be infested with schistosomes and ancylostomes, and to exhibit a significant degree of anaemia. Each patient had an acute course. Eighteen were of the ascending type, and of these six were of the spino-cephalic type; only two patients showed the purely cephalic form. In all patients showing affection of cranial nerves, the facial nerve was also affected.

No recurrences were noted among these patients. Sixteen (80%) of them exhibited an albumino-cytologic dissociation in cerebrospinal fluid. The rise in protein level did not show any relation to mortality. Fifteen patients showed satisfactory but slow improvement. Five patients died of respiratory failure, and, of these, one had bulbar and the other four had a spinal type of respiratory paralysis.

MATERIAL IN AUSTRIA

This part of the study includes 30 patients admitted to the Neuro-Psychiatric Clinic of the University of Vienna. These comprised 20 males and 10 females, whose ages ranged from 18-64 years, with a mean of approximately 38 years. Of 22 cases, 15 male patients were either farmers or heavy manual workers; the remainder were engaged in moderately hard work, and lived in rural districts.

Sixteen patients (8 males, 8 females) had an acute onset. Two men and 2 women developed the condition subacutely. Two other patients had recurrences. Nineteen showed the typical ascending type; of these, 10 were spinal and 9 spino-cephalic. Six were atypical, and 5 were purely cephalic. All patients, except one, showed albumino-cytologic dissociation in cerebrospinal fluid in varying degrees, and the protein level was not related to the severity of the disease.

Twenty-six patients developed the disease in the spring or autumn seasons. Eleven had foci of bacterial infection: 3 with apical dental abscess, 1 with myocarditis and 7 with chronic tonsilitis. Prodromal fever was evident in 8. Among patients in whom the paralysis was preceded by fever, none died. There were 8 deaths among the 30 patients. Of these deaths, 3 were in females above 60-years-old and 5 were in males who were heavy manual workers and who developed the disease in an ascending form. Necropsies were performed on all fatal cases. Significant post-mortem findings were oedema and congestion of the spinal roots, brain and spinal cord.

DISCUSSION

In comparing these two studies, several points of interest are apparent.

Age groups: As noted previously, the Iraqi patients were of a younger age group as compared to the European group. This may well be a reflection of the younger age of farmers and manual workers in Iraq. where most of the population engaged in these occupations is below 18 years of age.

Occupation: Both in Iraqi and European series, farmers and hard manual workers are the usual victims of this disease; such labourers comprised 100% of the Iraqi patients and 75% of the Europeans. This group of people, in both countries, is subjected to a greater degree of exposure to infections and to adverse weather conditions than is the general population. The epidemiology of the disease may be explained in part by the correlation between the peak incidence in spring and autumn, and the high degree of exposure at these times to colds and other viral infections.

Nutrition: At least in Iraq, this may be a highly significant factor. Farmers and manual workers are commonly under-nourished, sometimes to the extent of exhibiting clinical deficiency diseases. The frequent infection with helminths causes anaemia, particularly in southern or central Iraq. In patients with Guillain-Barré syndrome observed in Iraq, there is evidence of thiamine deficiency, in the general process of malnutrition; such factors may be responsible for the acute nature of this condition in Iraq. However, this assumption should be applied with reservations to patients in Europe, due to the large nutritional, social and economic differences. Differences in the acuteness of the disease may be nevertheless related to adequacy of diet in the two countries. Anaemia may also be involved in a nutritional sense, with consequent low resistance and liability to develop an acute form of the disease.

sex: The higher percentage of males (85%) in the Iraqi group, compared to that in the European group (67%), may reflect the greater number of women in Austria who are doing work usually performed by men in Iraq.

Incubation period: Review of the literature on aetiology of this disease reveals that various factors may be responsible.Mcfarland (1960), in his analysis of 26. cases, recognised initial infection in 15 cases; the time from the pre-infection to development of the Guillain-Barré syndrome varied from a few days to a few weeks. This interval might be considered to coincide with the time needed for development of an anaphylactoid reaction. In the Iraqi series of the present study, the disease was apparent within a few days after the prodromal fever.

Allergic or immunologic reactions: Waksman and Adams (1955) injected rabbits with peripheral nerve preparations + adjuvants. The resultant cerebrospinal fluid changes of albumino-cytologic dissociation

provide further support of the concept that an anaphylactic reaction could be the essential mechanism in production of the syndrome, and that the various clinical pictures which were simulated in the experimental animals could be attributed to differing concentrations of antigen in different parts of the nervous system. From this study also, it appears that persons with clinical or subclinical deficiency in thiamine, and thus with low neural levels of cocarboxylase, are victims of this syndrome or, at least, are predisposed to the affection, and are most likely to develop the condition in an extensive and acute form.

Development of an identical clinical entity as a complication after vaccination or similar prophylactic therapy also tends to confirm an allergic aetiology (Miglets and Bartlett, 1960; Miller and Stanton, 1954). The condition has been seen to develop also in association with definite allergic diseases such as anaphylactoid purpura (Sanghvi and Gupta, 11955). A case of this sort was personally observed in the Republican Hospital, Baghdad, in 1964.

The inability to detect microorganisms in the nervous system and the rarity or absence of finding of neurophages in the brain or spinal cord may be considered as further support of the anaphylactic hypothesis (Scheinker, 1955). The outstanding histopathologic change in the disease-complex is oedema, a finding similar to allergic reactions of the skin; since skin and the nervous system are of a common ectodermal origin, they might be expected to behave similarly, as they do, *e.g.*, in response to many drugs. The beneficial effects of cortisone in the literature (Blood *et. al.*, 1953) also favour the anaphylactic hypothesis.

SUMMARY

Comparative study of acute infectious polyneurities occurring in Iraq and in Austria showed large differences in age and sex incidences, and in the course of the disease. These differences seem to be due to social, economic, climatic and nutritional factors. Although a variety of causes may be ascribed to this syndrome, the aetiology and clinical course are explainable as an antigen-antibody phenomenon *per se*.

ACKNOWLEDGEMENT

The authors are grateful to Professor Hans Hoff, Chief of the Neuropsychiatric Clinic of Vienna University, for his kind permission to report the series of Austrian cases, and for his generous assistance.

REFERENCES

Blood, A., Locke, W. and Garabasi, R. (1953). Guillain-Barré syndrome treated with corticotropin (ACTH). *J.A.M.A.*, *152*: 139-140.

DeJong, R.N. (1940). Guillain-Barré syndrome. *Arch. Neurol. Psychiat., 44*: 1044-1068.

Guillain, F., Barré, J.A. and Strohl, A. (1916). The syndrome of radiculitis with hyperalbuminous acellular cerebro-spinal fluid. *Bull. Men. Soc. Med. Hop., 40*:

Hamdi, T. I. (1964). Disseminated hypersensitization neuropathy. *J. Fac. Med., Baghdad, 6*: 72-76.

Mcfarland, H. R., (1960). The Guillain-Barré disease complex. An analysis of the disease with therapeutic suggestions and report of 26 cases. *Calif. Med., 93*: 141-7.

Miglets, A. and Bartlett, W., (1960). Guillain-Barré syndrome resulting from tetanus antitoxin injection *Neurology, 10*: 658-661.

Miller, H. J. and Stanton, J. B. (1954). Neurological sequelae of prophylactic inoculation. *Quart. J. Med., 23*: 1-27.

Roseman, E. and Aring C. D., (1941). Infectious polyneuritis. *Medicine, 20*: 463-494.

Sanghvi, L. M. and Gupta, K. D., (1954). Disseminated hypersensitisation neuropathy. *Indian Med. Gaz., 89*: 484-491.

Sheinker, J., (1949). Pathology and Pathogenesis of Guillain-Barré syndrome, J. Neuropath. *Expth. Neuro., 8*: 184-193.

Waksman, B. H. and Adams, R. D. (1955). Experimental allergic neuritis. *J. Exptl. Med., 102*: 213-236.