

DIABETIC AUTONOMIC NEUROPATHY—CLINICAL EVALUATION‡

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INTRODUCTION :

Diabetic autonomic neuropathy is an elusive term to describe certain disorders of the autonomic nervous system in chronic diabetics. Included under this term are disturbances in cardiovascular, (Lloyd-Mosten and Watkins, 1975; Gunderson and Newbause, 1977), gastrointestinal, (Goldstein, Writs and Kowlessar, 1970), urinary (Ellenberg and Weber, 1967), genital, (Ellenberg, 1971) and other systems (Mandelstam et al, 1969). However studies documenting the actual prevalence of these components in diabetic patients have been extremely few. It is also not clear from available data whether two or more of these components coexist in the same patient.

There are a number of interesting differences in the clinical pattern of diabetes in India. These include the lower incidence of juvenile diabetes and the relative infrequency of ketoacidosis and obesity. The exact incidence of autonomic neuropathy in Indian diabetics has not yet been worked out. A large prospective clinical study on the incidence and clinical pattern of diabetic autonomic neuropathy is now in progress at this Centre. This paper presents a preliminary analysis of the results.

MATERIAL AND METHODS :

The clinical material consisted of diabetics attending the Diabetes Research Centre,

Madras, one of the large diabetic clinics in this area, with an annual registration of over 2,000 new diabetic patients.

100 diabetics were selected in a random manner. There were 30 controls comprising of laboratory and hospital personnel. 14 of the controls were aged between 22-40 years, with a mean age of 26 years, and 16 were older individuals between 48 and 65 years with a mean age of 58. Of the diabetics, 12 were young, 25-40 years (mean age 32 years) and 88 were older diabetics in the age group of 46-70 years (mean 54 years). 30 of the 100 diabetics were on insulin. The others were on oral hypoglycaemic agents. All the controls and the diabetics were males.

The protocol consisted of a questionnaire which included all symptoms of autonomic neuropathy. Each patient was specifically asked for presence of postural giddiness,

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nocturnal diarrhoea, facial sweating (gustatory) or anhidrosis, symptoms of bladder dysfunction such as loss of bladder sensation, incontinence etc. and impotence.

The physical examination included a search for postural hypotension, Argyl Robertson pupil, painless distension of the bladder and gastric splash. The presence or absence of peripheral neuropathy, retinopathy or other complications of diabetes were recorded.

Tests of Cardiovascular System :

A more detailed evaluation of the cardiovascular system was done. This included the resting pulse in the recumbent state and immediately after standing upright. Routine 12 lead ECG was done in all cases. We employed the test described by Ewing et al (1978) to determine the presence of autonomic neuropathy. Each subject lay quietly for three minutes, then stood up (within 5 seconds) and remained motionless for 2 minutes. A direct writing mechanism was used to identify the time of standing, although a characteristic muscle tremor usually appeared on the ECG as the subject stood up. The ECG was recorded from about 15 beats before to 40 beats after standing. The R-R intervals at the 15th beat and 30th beat after standing were measured with a ruler.

RESULTS :

Of the total number of diabetics analysed, the following gave a positive symptomatology suggestive of autonomic neuropathy (Table 1).

Physical examination for evidence of autonomic neuropathy revealed the following :

TABLE 1
SYMPTOMS OF AUTONOMIC
NEUROPATHY

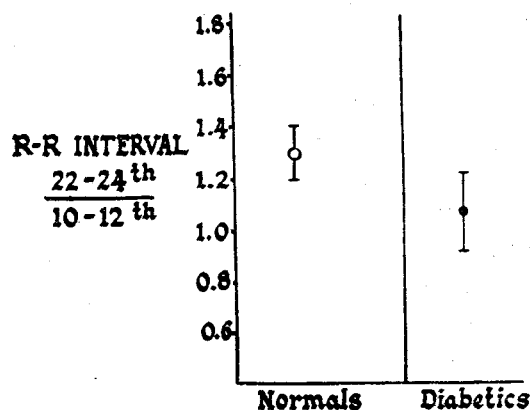
	Percentage
1. Impotence ..	26
2. Postural giddiness ..	10
3. Unexplained palpitation ..	6
4. Bladder incontinence ..	3
5. Facial sweating ..	2
6. Nocturnal diarrhoea ..	1
7. Swallowing difficulty ..	—

TABLE 2
SIGNS OF AUTONOMIC NEUROPATHY

	Percentage
1. Resting tachycardia ..	20
2. Postural hypotension ..	6
3. Painless distended bladder	3
4. Gastric splash	1
5. A.R. pupil	—

ECG Analysis :

Using the method described by Ewing et al (1978), the ratio of the R-R interval at the 30th beat/15th beat did not show any significant difference in the diabetics compared to controls. However when we employed the ratio of R-R interval at the 22-24th beat/10-12th beat there was a significant difference between diabetics and controls (Fig. 1).



DISCUSSION :

This paper highlights the incidence of autonomic disturbances in Indian diabetics. As clinicians we were struck by the relative infrequency of some of them like nocturnal diarrhoea. There being no epidemiological studies of the actual incidence of the various forms of autonomic neuropathy in diabetics from different centres, it is not possible to compare the actual prevalence rates.

The commonest symptom that was obtained was impotence. This was expressed by patients as a failure of erection. None of the patients complained of loss of libido or ejaculatory disturbances. Ten of the patients in this series complained of postural giddiness. However, objective evidence of postural hypotension as defined by a drop in the systolic blood pressure by more than 30 mm Hg on standing was seen only in 6 patients.

It is also interesting to note that there was a disparity between the prevalence of peripheral neuropathy and autonomic neuropathy in this study. This contrasts with the observations of Ellenberg* that the incidence of autonomic neuropathy in diabetics with peripheral neuropathy is as high as 80-90 per cent.

The commonest cardiovascular abnormality of the autonomic nervous system noted was resting tachycardia. The R-R interval variation in response to standing was also a useful test in diagnosis of the abnormality.

The diagnosis of the various clinical forms of the autonomic neuropathy system is still beset with problems for lack of definitive clinical criteria. It is hoped that future work in this direction, and serial follow up of patients will help solve some

of the enigma of diabetic autonomic neuropathy.

SUMMARY

The term Diabetic Autonomic Neuropathy includes a variety of disorders affecting the cardiovascular, gastro-intestinal, genital, urinary and other symptoms. The exact prevalence rates of these various components of Autonomic Neuropathy in diabetes remains to be established. In this preliminary analysis in a group of diabetics randomly selected from a large diabetic population, impotence was found to be the commonest symptom and resting tachycardia, the most frequently observed sign. Certain disorders like nocturnal diarrhoea were uncommon. The heart rate response to standing is a helpful test to demonstrate cardiovascular involvement.

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