the aneurysm no intimal tear could be seen as it was very friable. The aneurysmal sac was excised. Arterial continuity was restored by using a graft. Pulsations were good and no significant bleeding occurred from the graft or the anastomosis. The post operative course was uneventful and he returned to work. His hoarseness of voice improved but not the Horner's syndrome.

The usual presentation of these lesions is a symptomless pulsatile cervical mass; neurological symptoms may be the presenting features. Rapid expansion can result in dysphagia and respiratory obstruction.⁴ The hoarseness of voice in this case was probably due to compression of the larynx by the aneurysm as he had no vocal cord palsy. Horner's syndrome was due to cervical sympathetic chain involvement.

In India it is a common practice among the rural population to have manipulation of neck with oil massage for relief of neck pain, by a barber. The manipulation consists of sudden jerky and forcible flexion, extensions and rotatory movements. Hyperextension and rotation movements of neck can pull the internal carotid artery tightly against the lateral mass of either the C1 or C2 vertebra as the carotid is firmly rooted in the carotid canal at the base of the skull. Subsequent stretching or compression of the artery against the bony prominence can result in intimal tears and subsequent pseudoaneurysm formation.⁵ This mechanism was probably responsible for aneurysm formation in this case. Cases of cervical manipulation presenting with signs and symptoms of an acute internuclear ophthalmoplegia and brainstem dysfunction have been reported.⁶

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Unusual idiosyncratic reactions to carbamazepine

Sir: Two patients developed unusual idiosyncratic reactions to carbamazepine. *H.T. aged 59 years* had a past history of alcohol abuse and chronic pancreatitis. His medication included atenolol 100 mg/daily, isosorbide dintrate 10 mg/t.d.s. and Gaviscon (a combination of alginate acid, magnesium trisilicate, aluminium hydroxide and sodium bicarbonate). He developed blackouts associated with vomiting and was prescribed carbamazepine 200 mg/b.d. After receiving carbamazepine for 2 days he slept for 16 hours and on recovery exhibited bizarre, uncontrollable movements of both hands and arms, throwing any objects he grasped. The movements lasted 12 hours and no further carbamazepine was given.

J.T. aged 15 years had episodes of loss of consciousness which were later shown to be psychologically determined. On valproate he developed hypersomnia and was changed to carbamazepine 200 t.d.s.. He developed a rash and the dose was reduced to 100 mg/t.d.s. The rash cleared and he remained well for 5 months before complaining of tiredness and dizziness. A month later he started to walk slowly with small, shuffling, stiff limbed steps. His whole body was rigid and on examination he had repeated attacks of shivering involving most of his body. He recovered completely within a week of stopping his medication.

The shivering dystonia exhibited by J.T. is similar to the dose dependent dystonic movements induced by carbamazepine.¹ Ephemeral hemiballismic movements have not been reported with carbamazepine. Theoretically, interaction with atenolol or isosorbide could have raised the serum concentration of the carbamazepine; alternatively interaction with metal-containing

drugs as described by Okada *et al*² may have altered the pharmacodynamics of carbamazepine and explained the unusual nature of the dyskinetic movements.

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Autonomic neuropathy in systemic lupus erythematosus

Sir: In describing a case of acute autonomic neuropathy in association with systemic lupus erythematosus (SLE), Hoyle *et al*¹ remarked that autonomic function had yet to be assessed in any series of patients with this disease. In as much as this remains the position regarding the English language literature, we now report our findings in 14 such cases.

The patients were participants in a wide study of autonomic function in Raynaud's phenomenon (RP), a detailed account of which is in preparation. Five had RP,² while the remaining nine were randomly selected from our SLE clinic population to serve as RP case controls. When enrolled, none displayed symptoms typical of autonomic insufficiency.³

Each patient fulfilled established criteria for the diagnosis of SLE.⁴ All were black females, their ages ranging from 21 to 56 (median 34) years. None had diabetes, renal failure or clinical signs of cardiovascular disease. All were non smokers and denied alcohol consumption. In no case was medication being taken that reputedly affects adversely peripheral autonomic or somatic nerve function.^{3,5,6} Specifically, 12 patients were

receiving chloroquine (200 mg/day), 11 prednisone (3.5 to 60 [median 7.5 mg/day] mg/day), four indomethacin (150 mg/d) and one penicillamine (750 mg/d).

Autonomic function was assessed using the five cardiovascular tests described by Ewing and Clarke.⁷ That is, heart rate (HR) response to deep breathing, to Valsalva manoeuvre (Valsalva ratio) and to standing up (30:15 ratio); and blood pressure (BP) response to standing up and to sustained handgrip. All tests were conducted by the same investigators using arm sphygmomanometers and an electrocardiogram of standard design. The laboratory temperature was maintained between 20° and 26°C. Reference data were obtained from age-, sex- and race-matched healthy volunteers (controls).

One or more autonomic tests was abnormal in 13 of the 14 patients (table). In Cases 7 and 14, this included an abnormal, though asymptomatic, postural fall in systolic BP. The median resting HR of the patients also was significantly faster than that of the controls (83 compared with 72 beats/min; $p = 0.020$, Mann-Whitney test). Classified according to the grading system proposed by Ewing and Clarke,⁷ autonomic involvement was "severe" in two cases, "definite" in three, "early" in two, "early/atypical" in four and "atypical" in two (table). Twelve of the 13 patients also had clinical and/or electrophysiological evidence of peripheral sensorimotor neuropathy (table). The latter abnormalities were consistent with axonal degeneration⁸ and involved the sural nerve in nine cases and the peroneal nerve in seven. In one patient there was in additional involvement of the median sensory nerve.

According to standard works⁹ and a recent authoritative review,³ the occurrence in SLE of autonomic neuropathy is not well

recognised. The question therefore arises why it was detected so frequently in this study. The more so to the extent that 12 of the 14 patients were taking corticosteroids and/or indomethacin, agents that may have beneficial effects in autonomic failure.⁶ (The remarkable frequency also of peripheral neuropathy (see ref. 10) should be viewed, we believe, in the light of the autonomic findings). We should emphasise that, as a group, our African patients do not notably differ from those with SLE described from other parts of the world.¹¹ It seems to us the explanation that best fits the circumstances is the simplest, namely, autonomic function has not been habitually assessed in this disease.

Some support for this notion derives from two quite distinct sources. In reporting the pathological findings in biopsied sural nerves from seven patients with SLE and an associated peripheral sensorimotor neuropathy, McCombe *et al*¹⁰ recorded that in the six the density of unmyelinated fibres was significantly decreased compared with normal. These cases included the single patient in whom autonomic function not only was evaluated but also was abnormal. The pattern of abnormality was very similar to our patients'. Furthermore, and of particular note, the density of unmyelinated fibres exceeded that found in four of the other five (non evaluated) patients. It is noteworthy also that the peripheral neuropathy in their seven patients was predominantly sensory in type, as it was in ours. In the light of the foregoing, we venture to suggest that autonomic neuropathy may be quite common in SLE if searched for in those patients having an associated peripheral neuropathy in which sensory features predominate. Such a proposition is not without precedent, the second source of support being the obser-

vation that both in rheumatoid arthritis¹² and systemic sclerosis¹³ (two other immunologically mediated connective tissue diseases^{14,15}) patients, when investigated, have autonomic neuropathy more commonly than suspected. With respect to rheumatoid arthritis, this is especially so when there are clinical signs of an associated sensory neuropathy.¹²

The explanation we have advanced falls short, however, when considering Cases 1 and 3. Thus, in the former autonomic function was entirely normal yet there was clear evidence of peripheral neuropathy, while in the latter the converse obtained. Other than limited sensitivity of the respective tests, or simply fortuity, it is not readily apparent why these two patients were exceptions. Medication may have played a part, insofar as this comprised prednisone and indomethacin in the instance of Case 1 while chloroquine only in Case 3.

Although our study was not primarily concerned with the pathogenesis or natural history of autonomic neuropathy in SLE, three features merit comment in this regard. First, none of the patients was hospitalised, signifying that when studied their disease was not severe. Second, the single patient with normal autonomic tests had been "in remission" the longest. Finally, the degree of autonomic dysfunction did not bear any clear relation to the duration of disease (table). Before proper weighting can be given to these observations need to be replicated in larger series. Meanwhile, it is pertinent to mention that peripheral neuropathy can appear either before or after other clinical manifestations of SLE (see ref.¹⁰). Further studies are also needed to determine what relationship, if any, autonomic dysfunction might have to the overall behaviour of the disease; in particular, whether its presence

Table Autonomic function tests and nerve conduction studies (NCS) in systemic lung erythematosus patients, with relevant clinical data and neurological findings (signs)

Clinical data/Test/Signs	Case Number														Controls N = 25 (range)
	1	2	3	4	5	6	7	8	9	10 ^R	11 ^R	12 ^R	13 ^R	14 ^R	
Age (yr)	50	29	23	26	46	26	35	50	41	41	35	21	41	37	21-48
Duration of disease (months)	20	39	19	19	16	13	6	14	86	41	52	12	89	39	N/A
Change in HR, deep breathing*	14	2	6	10	8	17	15	15	20	15	7	24	4	12	10-39
Valsalva ratio	1:19	1:67	1:06	1:00	1:19	1:07	1:03	1:61	1:14	1:41	1:02	1:02	1:11	1:30	1:09-2:05
30:15 ratio	1:13	1:04	1:09	1:08	1:16	1:12	1:08	1:07	0:95	1:19	1:00	1:03	0:97	1:00	1:07-2:14
Change in systolic BP standing (mm Hg)	-4	-2	-6	-12	-6	0	-32	-12	-10	-10	-10	-12	-2	-18	-12 to +12
Change in diastolic BP handgrip (mm Hg)	28	37	26	7	13	22	29	5	44	9	6	27	11	9	22-49
Classification†	N	D	D	E/A	E/A	E	E/A	A	E	A	S	D	S	E/A	N/A
Hypoesthesia and/or areflexia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N/A
NCS‡	Abn	Abn	Nor	Abn	Abn	Abn	Abn	Abn	Abn	Abn	Abn	Abn	Abn	Abn	N/A

R = Raynaud's phenomenon *beats/min N/A = not applicable † = see ref. 2

N = normal E = early D = definite S = severe + = present - = absent

‡ = Median motor and sensory, sural and peroneal nerves Abn = abnormal (action potential amplitude or distal motor latency and/or conduction velocity of one or more studies outside limits for controls (n = 23)) Nor = normal (within limits for controls)

signals a poor prognosis as has been established for diabetes mellitus⁷ and may be the case in rheumatoid arthritis.¹²

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Magnetic resonance imaging in Fabry's disease

Sir: Fabry's disease (angiokeratoma corporis diffusum) is a rare sex-linked systemic disorder of glycosphingolipid metabolism.¹ The cardinal somatic manifestations are of a vascular skin rash (angiokeratoma), corneal dystrophy and acroparaesthesia and are well described elsewhere.² Neurological factors are highly variable and present as cortical, brain stem, and spinal cord lesions. The magnetic resonance appearances of this condition have not, to our knowledge, been reported previously.

A 40 year old man was admitted with dysphagia, dysphonia and burning paraesthesiae of both feet. He felt his right leg drag on walking. He was known to have Fabry's disease and his family have previously been described (family A).² The paraesthesiae of both feet had been present since the age of nine and a characteristic rash had developed. The patient had an episode of colitis 6 years prior to the current presentation and intermittent psychiatric contact for several years for repeated episodes of acute confusion.

Examination showed coarse facial features and bilateral ptosis. There were multiple small violaceous angiokeratomata on the lower abdomen and lower thighs. Blood pressure was 140/80 mm Hg. Dysarthria and dysphonia were found with a diminished gag reflex. No limb weakness was identified. Further examination of the nervous system was normal but for brisk knee and ankle jerks in the right leg.

After 7 days, the patient became acutely confused with a paranoid psychosis. Acute confusional states associated with Fabry's disease can be due to disordered calcium or magnesium levels but no organic cause was found. Urinalysis showed proteinuria and the creatinine clearance was 56 ml/minute. Chest radiographs revealed cardiomegaly. The magnetic resonance imaging (MRI) head scan showed there was periventricular high signal affecting the entire ventricular system and several small discrete periventricular lesions (fig). These features are

Fig Spin echo (TR1200, TE96 ms) image through the ventricles showing periventricular high signal and discrete lesions suggestive of demyelination.

very similar to the MRI appearances of demyelination. However, rounded discrete lesions were also seen in the basal ganglia and pons and these are more in keeping with the appearance of lacunar infarcts of vascular aetiology.

The central nervous system manifestations of Fabry's disease have been described in hemizygotes^{1,3} and heterozygotes.⁴ The presentation may be sudden or gradual, and the features permanent or transient, often with exacerbations affecting distant parts of the nervous system, making the diagnosis difficult. The neurological features can be similar to multiple sclerosis⁴ and interestingly our patient's MRI scan showed features suggestive of demyelination. Demyelination has not been shown on pathological studies, however.⁵

Vascular involvement in Fabry's disease is prominent in the nervous system, as it is elsewhere in the body. Sudden episodes of neurological dysfunction can be attributed to transient ischaemic attacks, cerebral haemorrhage or thrombosis. The lacunar infarcts seen on MRI are typical of ischaemic type lesions and would account for our patient's complaints of dysphagia and the hyperreflexia of the right leg.

The pattern of glycosphingolipid deposition in Fabry's disease, particularly its predilection for vascular endothelium, smooth-muscle cells and certain neuronal groups, is different from other glycolipid storage diseases. Since MRI is now recognised to be the method of choice in cases of demyelination and is highly sensitive to the