

## **DIABETES IN THE ARMED FORCES**

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### **Introduction**

The armed forces of India is a mixed population comprising of people of different genetic backgrounds from different parts of the country and with widely differing socio-economic backgrounds. The study of diabetes mellitus, a metabolic disorder known for its varied spectrum of presentation, in a community representing a good cross section of people from the length and breadth of our country should therefore make it interesting. Besides, the implications of developing a chronic disorder with such far reaching consequences for a person serving in an establishment where fitness takes priority over every thing else is also worth considering,

### **Epidemiological Differences**

Though the armed forces personnel are a good representative sample from the whole country there are considerable differences compared to a general population sample. They are much younger, generally healthier, much better nourished, and their physical fitness is of the top order. They are all males (except an insignificant number of medical and paramedical personnel). There are considerable socio economic and cultural differences between the officer class on one hand and the junior commissioned officers (JCO's) and other ranks (ORs) on the other-the former tend to lead a more sedentary and affluent life style.

### **Diagnostic Implications**

Unlike civil services and private enterprise the diagnosis of diabetes in an army person carries important and far reaching implications, These consequences may be considered as general or service linked. The general implications are the same as his civilian counter part - namely, the increased morbidity due to the cardio-vascular, retinal, neurological and renal problems and the decreased life span. The service linked implications are however much more serious. If the disease is complicated or if he needs insulin for the diabetic control he is discharged (invalided out) from the service and faces bleak future in the civil life.

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Since the disease, at least the NIDDM, is considered *a* constitutional disease he is not entitled for any disability pension (neither attributable nor aggravated by service). If he is however well controlled on diet/drugs and has no complications he is downgraded to a "low medical category" for a maximal period of two years, during which period he is given "sheltered appointment". Low medical category brings in its wake its own problems-the promotion prospects are bleak, extension of service is not given and chances of getting re-employed after discharge from the service are that much less. And if within two years his diabetes does not fully remit and the chances of this happening with frank diabetes is rare-he is placed in a "permanent low medical category" and runs the risk of being sent home if the establishment finds it difficult to give him a "sheltered" employment. The role of the army is such that the establishment has its own problems in finding suitable employment for people suffering from chronic illnesses like diabetes. Some exceptions are made especially with officers and skilled tradesmen but as brought out earlier, their future service prospects are far from bright.

### **Prevalance of Diabetes in the Army**

The hospital admission figures for diabetes:—all serving army personnel diagnosed to be diabetic are initially admitted for a complete work up—for the years 1976 - 1986 is given in Table-1. Though the prevalance rate is much lower

**Table 1**

#### **Yearly Hospital Admission Rate for Diabetes**

1976-1986.	(Per 1,000 of Army Personnel)	
<i>Year</i>	<i>Officers</i>	<i>JCOs and Other Ranks</i>
1976	2.69	0.80
1977	3.22	0.81
1978	3.27	0.82
1979	3.49	0.88
1980	3.70	0.95
1981	3.63	0.85
1982	2.52	0.55
1983	1.99	0.53
1984	2.31	0.53
1985	2.01	0.55
1986	1.98	0.52

than in the general population, the adverse service implications inherent in the diagnosis magnifies the problems involved. The figures also bring out two other noteworthy points. The prevalence is much higher amongst officers and their life style (less of physical activity and more affluence) may have a bearing on this; secondly, there seems to be a significant difference in the figures for years prior to 1981 and the figures from 1982 onwards. This is a phenomenon directly attributable to the change in the attitude towards this disease which saw the framing of a revised protocol for dealing with the diabetics from 1982 onwards.

### **Changed Attitude and Revised Protocol**

The impression that we are probably overdiagnosing diabetes in the armed forces and are viewing the disease with much more pessimism (as is evident from the invalidment figures for the disease) was shared by many armed forces physicians in the sixties and seventies. Many suggestions were made to liberalise the outlook but these were the days when the classification of and the diagnostic criteria for the disease were in a state of flux with total lack of unanimity of opinion regarding both. The author had a chance to list out some of the G.T.T protocols that were in vogue prior to 1980 the variations in the glucose load, duration of the test and the end point criteria for diagnosis was indeed alarming. The recommendation of WHO Expert Committee on Diabetes Mellitus<sup>2</sup> in 1980 regarding the standardisation of diagnostic criteria and the delineation of the newer group viz Impaired Glucose Tolerance" came, as it were, as an answer to

**Table 2**

#### **GTTS before 1980: Protocol and Diagnostic criteria**

Recomending Body	Glucose Load/g	Duration of test(hrs)	Diagnostic		criteria	
			F	Peak	2h	3h
i) Mesenthal and Barry(1950)	100	2	-	150	100	
ii) Mayer and Womick(1950)	100	2	-	168	128	
iii) Fajans and Conn (1954)	1.75g/kg	2	120	160	120	
iv) BDA	50	2	-	180	120	
v) USPHS	100	3	110	170	-	110
vi) WHO(1965)	50	2	110	-	110	-

our dilemma. An analysis of our data of diabetics diagnosed prior to 1980 brought out two major and relevant observations.

- i. There was overdiagnosis of diabetes due to various factors elucidated below
- ii. There was no provision for delineation and retention in service of people with marginal/transient glucose intolerance.

The overdiagnosis in the past was due to:-

- a) Criteria used for diagnosis-based on recommendation of various Diabetic Associations-were stringent.
- b) GTT was being done in every case irrespective of the age.
- c) Cortisone GTT as recommended by Fajans and Conn<sup>3</sup> was being resorted too often.
- d) There was no provision to differentiate frank diabetes from mild glucose intolerance as the category presently designated as IGT was non existent in the older classification.

### **Revised Protocol**

The protocol for diagnosis and disposal was therefore revised in 1981 based on the newer diagnostic criteria recommended by WHO<sup>2</sup>, Type-I is now differentiated from Type-II and in the latter IGT is delineated. The IGT patients are put back to SHAPE One medical category if there are no risk factors and if they do not develop frank DM. Only people with vascular complications or who need insulin are invalided out of service.

### **Unsolved Problems**

While NIDDM is considered constitutional and hence not attributable to service, the position regarding IDDM is debatable. Viral infection is implicated in the aetiopathogenesis of IDDM and it can be attributed to any infection contracted in service.

### **Spectrum of Complications**

The prevalence and spectrum of different complications seen in diabetics attending a diabetic clinic in one of the armed forces hospitals is given in Table-3. Since the clientele include the families and dependants of army personnel the data would compare favourably with any other sample in the country. It will be seen that as many as 48% of the 673 patients had one or other of the chronic complications, the commonest being neuropathy. The findings in a

**Table 3****Prevalance of Complications**

	No.	%
No. Studied	673	
Type-1	30	4.4
Type- 11	643	95.6
Uncomplicated	350	52.0
Complicated	323	48.0
Macrovascular		
CVD	148	22.0
CAV	27	4.0
PVD	68	11.4
Retinopathy	92	13.6
Nephropathy	19	2.8
Neuropathy	236	35.1

subset of 310 patients of neuropathy studied in detail using electrophysiological tests and for autonomic dysfunction are given in Tables 4 & 5. Valsalva mane-ouvers and maximal deep breathing tests were the two tests which were used to confirm or exclude autonomic neuropathy and both were found to be reliable and reproducible.<sup>4</sup>

Diabetic nephropathy was the second commonest cause of End Stage Renal Disease (ESRD) encountered in the armed forces. 16% of the 96 cases of ESRD due to diabetic nephropathy that was studied and either IHD (12%) or CVA (4%) and almost all of them had evidence of retinopathy; Contrary to other reports, however, only 4% of these were proliferative. Most of these cases were on peritoneal dialysis and the long term prognosis was predictably poor.

Diabetic retinopathy was found in 13.6% of patients studied but when fluorescein angiography was done on some of these patients it was concluded that conventional ophthalmoscopy alone misses 25% of diabetic retinopathy. Besides, fluorescein angiography was found to be helpful in earlier detection and better delineation of lesions and also helps in monitoring the progression of lesions. The study also brought out that it is simple, safe and easy to interpret.<sup>5</sup>

**Table 4**  
**Diabetic Neuropathy**

Prevalance	No.	%
No. Studied	310	
No. with Neuropathy	239	74
No. with Somatic -f Autonomic	149	46
No. with Somatic only	65	20
No. with Autonomic only	25	8
<i>Pattern of Somatic neuropathy</i>		
Polyneuropathy	61% (12% pure motor)	
Mononeuropathy	2%	
Diabets in Amyotrophy	2%	
Radiculopathy	1%	

**Table 5**  
**Autonomic Neuropathy in Diabets Mellitus**

Total No.	310
No. with Autonomic Neuropathy-118	(38.2%)
<i>Symptoms</i>	
	%
Impotence	30.9
Bladder symptoms	5.4
Diarrhoea	5.4
Constipation	1.8
Gastric fullness	2.7
Disturbances of sweating	7.2
<i>Signs</i>	
Resting tachycardia	10
Testicular sensation	6.3
Postural Hypotension	3.6

Pulmonary tuberculosis was detected in 4.4% of 673 cases of diabetes whereas diabetes was detected in 16% of 2,047 consecutive cases of pulmonary tuberculosis in army personnel.

## **Conclusion**

In conclusion it may be said that though the overall prevalence of diabetes in the armed forces personnel is expectedly less, it has many sinister diagnostic implications as far as service prospects are concerned. Overdiagnosis of this disorder in the past has now been corrected by application of newer criteria, standardization of GTT and delineation of the IGT group. On the whole a more liberal view is now being taken as regards their continuation in service. IDDM is rare in the army and MRDM is hardly ever seen.

## **References**

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