DISCUSSION
Diabetes mellitus is known to man from antiquity. It is a syndrome of panmetabolic disorder and presents with metabolic and vascular components which are inter-related to each other. Insipite of the increased survival of diabetics with proper therapy, the cardiovascular complications inherent to diabetes still remain the most important consequence of it. The magnitude of the problem can be well judged with the presence of definite and often multiple cardiovascular complications in more than three fourth of diabetic patients (when considered without regard to age, sex, or duration of diabetes) reflects distinctly the nature of problems of cardiovascular consequences of diabetes mellitus at present time.

Paucity of Indian literature on lipoprotein patterns in different cardiovascular complications, incidence of fascicular blocks, results of positive stress test among diabetics and correlation of microangiopathy with other complications in diabetes led to the present study.
The present work has been undertaken with a view to study cardiovascular complications, cardiac involvement, hypertension, diabetic nephropathy, diabetic retinopathy, peripheral vascular disease and microangiopathy in skin vessels. An attempt has been made to see the bearing of age, sex, duration, serum cholesterol and lipoproteins on various cardiovascular complications.

In our study cardiovascular complications were observed in 65 diabetics (88.56%). This incidence is higher than those reported in literature so far. But this high incidence is accounted for this study because diabetics having microangiopathy only (seen on skin biopsy), latent peripheral vascular disease (diagnosed on basis of low second toe digital pressure) and/or positive stress test, were included in group of diabetics with cardiovascular complications. This has not been done in any of the papers reported so far. On excluding the patients who had only microangiopathy, latent peripheral vascular disease and/or positive stress test, only 42 diabetics (56.9%) had cardiovascular complications, bringing the incidence similar to those reported by Bryfogle and Bradley (1957) 49.5%, by Lewis and Symons (1958) 42.5% and by Singh Verma et al (1979) 46%. It brings out therefore, that more strict are the criteria for cardiovascular complications, higher is the incidence of these in diabetes. It is also evident from the observations of Agarwal et al (1977) and Nigam et al (1980) who have given
higher incidence of cardiovascular complications (62.3% and 59.6% respectively) as they included diabetics with latent peripheral vascular disease diagnosed on basis of low IIInd toe digital pressure in it. High incidence of cardiovascular complications has been also reported by Banarjee and Mukharjee (1967), 66.7%, and Mukharjee (1971), 73.0%.

There is an increased in incidence of cardiovascular complications with advancing age in our study and has also been reported by Bradley (1959). The higher incidence of cardiovascular complication in elderly age group has also been observed by Mukharjee (1971), Vaishnav and Bhasin (1974), Nigam et al (1977), and Singh verma et al (1979). This increase in incidence of vascular complications with increase in age is attributed to increased prevalence of atherosclerosis in older patients (Lewis and Symons 1958).

Males were affected more frequently than females (86.2% and 64.7% respectively) which is in confirmatory with the observation made by Pathania and Sachar (1961), Mukharjee (1971) and Singh verma (1979).

We observed a definite correlation of cardiovascular complications with duration of diabetes. The incidence was 100% in diabetics having duration of diabetes more than 10 years.
After 10 years or more years of diabetes, Bryfogle and Bradley (1957) and Singh verma et al (1979) found the incidence of cardiovascular complications to be 57.5% and 80.6% respectively which corresponds well to our observations. Similar increase in incidence with increasing duration of diabetes has been also observed by Lewis and Symons (1958) and Mukharjee (1971) and Nigam et al (1980). 52.3% of diabetics having cardiovascular complications, had hypercholesterolaemia. There was increase in incidence of cardiovascular complications with increasing serum cholesterol levels which is in accordance with the observation of Mukharjee (1971). The levels of serum cholesterol were significantly high in comparison to control group (p<0.01). Serum cholesterol levels were higher in diabetics with cardiovascular complications than in diabetics without these complications but difference was statistically insignificant (p>0.05). Similar results have been also observed by Singh and Ghosh (1960), Mukharjee (1971), Amini et al (1976), Singh verma (1979) and Suri et al(1979).

Hyperlipoproteinaemia was present in 55.38% diabetics with cardiovascular complications. Type IIa hyperlipoproteinaemia (30.76%) was most frequent abnormal pattern detected. Similarly Amini et al (1979) and Shrivastava et al (1979) observed type IIa hyperlipoproteinaemia as commonest abnormality in diabetics with cardiovascular complications.
**CARDIAC INVOLVEMENT**

Cardiac involvement in this study was detected in 40% (30 cases). Similar observations have been reported by Liebow et al (1955) 42.0%, by Bryfogle and Bradley (1957) 40.1%, by Cohen et al (1963) 45% and Banarjee (1966), 35%. This incidence is less than that of 56.7% by Banarjee and Mukharjee (1967) and 60.0% by Mukharjee (1971), but more than that of 10.3% reported by Lewis and Symons (1958) and 23.96% by Dutta et al (1976).

On including diabetics with positive stress test, the incidence of cardiac involvement increased to 61.33% (46 out of 75 diabetics). Similar increase in incidence on including the cases with positive stress test has been reported by Vaishnav et al (1964). The incidence of cardiac involvement increased with advancing age, reaching to its peak (75.0%) in age group of 61-70 years. Similar increase in the incidence with advancing age has been observed by Bryfogle and Bradley (1957), Vaishnav (1964) and Banarjee and Mukharjee (1967) who also reported maximum incidence in 7th and 8th decade. Mukharjee (1971) reported the highest incidence of cardiac involvement in the age group of 60-69 years and 70-79 years (50.0% and 60.0% respectively). There was no patient in age group of 71-80 years in our study.

In the present series the incidence of cardiac
involvement was more common among females (64.7%) as compared to males (32.75%). This is in agreement with the observation of Lundbaek (1954), Liebow et al (1955), Bradley and Bryfoogle (1956) and Agarwal et al (1977). In contrary, Pathania and Sachar (1961), Mukharjee (1971), Dutta et al (1976) and Nigam et al (1977) observed a male predominance. Freedome from cardiac involvement in non-diabetic woman is significantly reversed in diabetics. It appears as if diabetes knocks out the relative immunity against atherosclerotic heart disease among females (Clawson and Bell, 1949).

Evidence of ischaemic heart disease was present in 21.3% (16 out of 75) diabetics. Similar incidence of ischaemic heart disease has been reported by Pathania and Sachar (1961) 21.7%, 25.1% by Lal and Bahl (1967) and 29.1% by Nigam et al (1977). Higher incidence has been reported - 66.0% by Lundbaek (1954), 42.0% by Liebow et al (1955), 40% by Bradley and Bryfoogle (1957), 70.9% by Banarjee and Mukharjee (1971), 39.7% by Agarwal et al (1977) and 38.7% by Chetty et al (1978). Our findings are higher than that of 9.21% by Vaishnav (1974), 13.9% by Dutta et al (1976) and 15.0% by Singh Verma (1979).

The incidence of Angina pectoris was 13.25%. Similar incidence of angina pectoris has been reported by
Bryfogle and Bradley (1957) 9.1%, by Lewis and Symons (1958) 11.6%, and by Dutta et al. (1976) 10.52%. Lower incidence has been observed by Banarjee and Roy (1958) 4%, and Mukharjee (1971) 7.0%. The higher incidence has been observed by Nigam et al. (1977) 29% and Chetty et al. (1978) 33%.

The incidence of myocardial infarction was 8.05% in present study. Almost similar incidence of myocardial infarction has been observed by Liebow et al. (1955) 6.8%, by Bryfogle and Bradley (1957) 8.6%, by Lewis and Symons (1958) 7.6%, by Dutta et al. (1976) 3.67%, by Nigam et al. (1977) 5.8% and by Chetty et al. (1978) 4%.

The maximum incidence of ischaemic heart disease is found to be in 5th and 6th decades. The incidence increases with successive decades of life. This compares well with other studies of Dutta et al. (1976), Nigam et al. (1977), Agarwal et al. (1977) and Chetty et al. (1978). Ischaemic heart disease in diabetics involves older patients in whom coronary atherosclerosis has been accelerated.

The incidence of ischaemic heart disease among diabetics of 40 years of age or above and 50 years of age and above was 28.57% and 32% as compared to similar figures of 44.6% and 48.4% by Mukharjee (1971), 39.4% and 43.8% by Banarjee (1966) and 56.2% and 66.4% by Bryfogle and Bradley.
In the present study among diabetics with ischaemic heart disease, there is a preponderance of females with 35.28% when compared to males with 17.24% incidence. Similar dominance has been observed by Chetty et al (1978) who also observed ratio of male and female to be 45.0% Vs 33.5%. Similar observations of female dominance in diabetics with ischaemic heart disease has been reported by Lundbaek (1954), Liebow et al (1955), Bradley and Bryfogle (1956) and Agarwal et al (1977). In contrast, Pathania and Sachar (1961), Banarjee (1966), Mukharjee (1971), Dutta et al (1976) and Nigam et al (1977) have found an increased incidence in male diabetics. Diabetic woman seem to lose protective immunity against ischaemic heart disease as shown by the autopsy studies of Clawson and Bell (1969), where fatal coronary artery disease is three times common in diabetics than the non-diabetic woman.

The incidence of cardiac involvement and ischaemic heart disease increases with the duration of diabetes and reached its peak in patients having diabetes for more than 10 years (100% and 40% respectively). This is in accordance with the observations of Bryfogle and Bradley (1957), Pathania and Sachar (1961), Banarjee (1966), Nigam (1977) and Chetty et al (1977).

Out of 16 cases of ischaemic heart disease,
11 cases (68.75%) had hypercholesterolaemia and the levels were significantly higher in comparison to control group (p<0.01). It is in agreement with the observations of Ahuja (1969), Gossain and Ahuja (1967), Lowy and Barach (1957). Patney (1979) and Suri et al (1979) also observed significantly high serum cholesterol levels in diabetics with ischaemic heart disease. Type IIa was commonest abnormality detected in diabetics with ischaemic heart disease and mainly beta lipoprotein was elevated in diabetics with ischaemic heart disease. This is in agreement with the observations of Lowy and Barach (1957), Patney (1979) and Gustafon et al (1979). In contrary, Enger and Ritland observed type IV hyperlipoproteinaemia as commonest abnormality.

In present study, hypertension was associated with cardiac involvement and ischaemic heart disease in 36.66% and 43.75% respectively. This is in accordance with the observation of Pathania and Sachar (1961), Dutta et al (1976), and Nigam et al (1977). Slightly higher incidence has been reported by Banarjee (1966) and Lower incidence by Chetty et al (1978). The incidence of associated nephropathy and retinopathy were 37.5% and 31.25% respectively in diabetics with ischaemic heart disease. Similar incidence has been observed for retinopathy by Dutta et al (1976) but incidence for associated nephropathy was slightly lower. The incidence of associated complications particularly of hypertension, was
was higher among diabetics with ischaemic heart disease in comparison to cases without ischaemic heart disease.

**Incidence of silent myocardial infarction**

Completely painless myocardial infarction was present in 50% of diabetics (3 out of 6) with myocardial infarction. Similar incidence has been observed by Bradley and Schonfeld (1962) 42%, Agar (1962) 61.1%, Singh Verma et al (1975) 41.9% and Banarjee (1966) 60%. However lower incidence has been reported by Mukharjee (1971) 11.7% and by Partiaman and Bradley (1965) 24.1%. This incidence of silent myocardial infarction is significantly higher among diabetics in comparison to non-diabetic population (10% by Lindberg, 1960 and 11% by Stokes and Dawber 1959).

The mechanism by which relative absence or decrease in pain with myocardial infarction in diabetics, has been postulated by Friedberg (1966) to be diffuse changes in small intramural myocardial blood vessels which consequently have reduced blood flow with limited collateral circulation resulting in myocardial hypoxia without actual infarction. But subsequent occlusion leads to myocardial infarction promptly which is painless. Unexplained upset in control of diabetes, nausea, vomiting or otherwise unexplained discomfort in the arm might be the only clues, if at all, to diagnosis of myocardial infarction among diabetics, as they were present in 2 of our cases.
Site of myocardial infarction

Anterior wall and antero-lateral wall
infarction were equally common in present study (33.3% each) followed by an equal frequency of lateral wall and inferior wall myocardial infarction (16.6% each). Singh verma (1976) also observed an predilection for anterior wall infarction. Contrary to this, Dutta (1976) reported highest incidence for inferior wall. However Pahtania and Sachar (1961) could not find any such predilection.

Bundle branch blocks

Fascicular blocks have been observed in 8% cases of diabetes mellitus which is in confirmatory with the observations of Partiaman and Bradley (1965) 6.3%, Dutta et al (1976) 6.11% and Singh verma et al (1978) 7.3%. The incidence of fascicular blocks were maximum in elderly diabetics which is in accordance with the observations of Singh et al (1978).

Right bundle branch block was the commonest block in diabetes and was seen in 5.34% cases which is in agreement with the reports of Singh et al (1978) and this incidence is significantly higher as compared to 0.18% in general population (Hiss and Lamb, 1962) and 0.41% in unselected hospital population (Ostrander, 1964).

The existence of fascicular block in 7.3% of diabetics raises the question that "are the fascicular
blocks manifestation of ischaemic heart disease due to atherosclerotic coronary artery involvement?" Such high incidence of blocks without any evidence of associated coronary artery disease does not support ischaemic etiology and needs explanation. As L.A.H.B. was present in 1 case with R.B.B.B. (bifascicular block) and both of them share blood supply from descending branch of left coronary artery, the involvement of this artery in diabetics awaits confirmation from other reports. The comparative higher incidence of R.B.B.B. in diabetics where other causes of conduction defects have been excluded, deserves attention. The possibility of idiopathic fibrosis of bundle, being caused or enhanced by diabetes needs confirmation by histopathological study (Singh verma et al., 1978).

Cardiac enlargement and cardiomyopathy

Cardiac enlargement was present in 8 of the cases of present study. Out of which 3 had left ventricular hypertrophy secondary to severe systemic hypertension and 1 had right ventricular hypertrophy secondary to cor-pulmonale. 4 cases had unexplained cardiac failure with cardiomegaly. It might be possible that cases might had microangiopathy involving myocardium as described by Rubler et al. (1972) or of ischaemic cardiomyopathy described by Burch et al (1972). Similarly Dutta et al. (1976) reported 15 cases of unexplained cardiomegaly among 817 diabetics, Agarwal et al. (1977) reported 3 cases out of 53 diabetics
and Chetty et al (1978) reported 2 cases out of 200 diabetics.

Stress test

Stress test was positive in 21.3% of diabetics (16 out of 75 diabetics). This is in agreement with the report of Bellet and Roman (1967) who found its incidence to be 22.3%. This incidence is significantly higher in comparison to incidence of positive stress test among non-diabetic population (8-12%, reported by Bellet and Roman, 1967). The incidence among the patients having age more than 40 years was 21.43% and below the age of 40 years was 21.2%. Almost similar results have been reported by Bellet and Roman (1967). This much high incidence of positive stress test among diabetics below the age of 40 years is significant and gives an warning regarding development of ischaemic heart disease among them. Most of the diabetics who had positive stress test had hypercholesterolaemia (13 out of 16, 81.3%). This is in accordance with the observations of Bellet and Roman (1967).

HYPERTENSION

The incidence of hypertension was 18.67% among 75 diabetics. Similar incidence has been observed by Abou khatwa (1963) 20.2%, by Vaishnav et al (1964) 17.6% and by Singh verma (1979) 14%. However it is less than that of 60% as reported by Lundbaek (1954) 42.8%, by Pathania
and Sachar (1961), 45.3% by Banarjee and Mukharjee (1967),
40% by Mukharjee (1971) and 32.7% by Nigam et al (1980).
There was increase in the incidence of hypertension with
advancing age. Similar increase in incidence with advancing
age has been observed by Banarjee (1966), Tulloch (1961),
Banarjee and Roy (1959) and Balme and Cole (1951). Hyper-
tension was more frequent in elderly diabetics which is in
accordance with the observation of Mukharjee (1971). However
increased frequency of hypertension has also been observed
among elderly persons in general population by Hamilton et
al (1954), Boe et al (1957) and Wig et al (1953). The
highest incidence of hypertension was observed in diabetics
of 61 to 70 years age group (37.50%). Vaishnav et al (1964)
also observed highest incidence of hypertension in 7th
decade.

Females were affected more frequently than males
(25.53% and 17.24% respectively). Balme and Cole (1951),
Tulloch (1962), Bryfogle and Bradley (1957) and Freedman
et al (1958) also observed female dominance. In contrast,
Mukharjee (1971) and Vaishnav et al (1964) observed
hypertension to be more frequent among male diabetics.

There was an increase in incidence of hypo-
tension with increasing duration of diabetes and maximum
incidence was seen among diabetics having disease for more
than 10 years (90.0%). Similar correlation of incidence of
hypertension with duration of diabetes has been observed by
by Pathania and Sachar (1961) and Mukharjee (1971).

Serum cholesterol levels were significantly high among diabetics with hypertension in comparison to normotensive diabetics and control group (p<0.01). This is in agreement with the observations of Suri et al (1979). Type IIa was commonest hyperlipoproteinaemia detected in hypertensive diabetics. In contrary Suri et al (1979) found type IV hyperlipoproteinaemia to be the commonest pattern. The difference between our observation and that of Suri et al (1979) might reflect a genetic difference between our samples and even the difference of etiological factors responsible for hypertension.

Incidence of associated vascular complications were significantly high among diabetics having hypertension in comparison to normotensive diabetics. The incidence of cardiac involvement and ischaemic heart disease was more than double among hypertensive diabetics in comparison to normotensive diabetics (78.6% Vs 31.15% and 50.0% Vs 14.7% respectively). This is in accordance with the observations of Pathania and Sachar (1961), Liebow et al (1955), Lewis and Symons (1958), Mukharjee (1971), Agarwal et al (1977) and Nigam et al (1980). Incidence of nephropathy and retinopathy was 35.7% and 50.0% among hypertensive diabetics in comparison to 14.75% and 24.59% among non-hypertensive diabetics respectively. Similar high incidence among hypertensive diabetics has been observed by Mukharjee (1971),

**DIABETIC NEPHROPATHY**

18.66% of diabetics (14 out of 75) had diabetic nephropathy. Almost similar incidence of diabetic nephropathy has been observed by Mukharjee (1971) 16%, Lundbaek (1954) 25%, Bell (1953) 25%, Tulloch (1962) 12.1%, Banarjee and Mukharjee (1967) 15.3% and by Nigam et al (1980) 21.2%. This incidence is less than that of 35.9% as reported by Agarwal et al (1977) and is more than that of 10% as reported by Bryfogle and Bradley (1957), 5.7% by Pathania and Sachar (1961), 4.1% by Lewis and Symons (1958) and 2.6% by Abou khatwa (1963). Only 14.3% (2 out of 14 diabetics) were below the age of 40 years which is in agreement with the observation of Pathania and Sachar (1961) who observed 12.5% cases of diabetic nephropathy below 40 years. There was increase in incidence of nephropathy from age of 30 years to 70 years except that one case of diabetic nephropathy was in the age group of 11-20 years. Pathania and Sachar (1961) also observed similar increase in incidence with advancing age.

Males were slightly more affected than females (18.96% vs 17.6%). Similar preponderance of male over female has been reported by Pathania and Sachar (1961), Bhal et al (1967) and Mukharjee (1971). Contrary to this observation, Kimmelstiel and Porter (1948) reported higher incidence among female diabetics.
There was an clear cut increase in incidence of diabetic nephropathy with increasing duration of diabetes and this is in confirmation with the report of Goodof (1945), Henderson et al (1947), Dunlop (1945), Bhal et al (1967) and Mukharjee (1971).

All the diabetics with nephropathy had hyper-cholesterolaemia and serum cholesterol levels were significantly high among diabetics with nephropathy in comparison to diabetics without nephropathy and control group (p<0.01). This is in agreement with the observations of Man et al (1949), Keiding et al (1952), Demanet et al (1959), Mahallawy et al (1960), Sinha and Ghosh (1960) and Suri et al (1979). Type IIa was commonest hyperlipoproteinaemia detected. This is in agreement with the observations of Keiding et al (1952), Demanet et al (1959), Sinha and Ghosh (1960) and Srivastava et al (1960), Engelberg et al (1952) and Lowy and Barach (1957). In contrary, Suri et al (1979) found type IV hyperlipoproteinaemia as commonest abnormality.

Cardiac involvement and ischaemic heart disease were more commonly associated with diabetics with nephropathy than diabetics without nephropathy (71.4% and 42.84% Vs 32.78% and 16.4% respectively). Hypertension was more commonly associated in diabetics with nephropathy than without nephropathy (35.7% Vs 14.75%). Similar increase in incidence of associated hypertension in diabetics with
nephropathy has been observed by Kimmelstiel and Wilson (1936), Dixit et al (1966) and Gupta et al (1980). 78.57% of diabetics with nephropathy had retinopathy which reflects close association of retinopathy and diabetic nephropathy. This is in accordance with the observation of Wagner (1945). Similar association has been observed by Gupta et al (1980).

Retinopathy

29.33% of all diabetics had retinopathy. Different authors have reported almost similar incidence i.e. 24% by Soutomaior and Besisio (1947), 33.2% by Larsson et al (1952), 22.77% by Rallie et al (1955), 20.6% by Wagner (1945), 23% by Lal et al (1968), 21.5% by Vaishnav (1974) and 25% by Singh verma (1979). However, this incidence is less than that of 52.7% as reported by Banarjee and Mukharjee (1967), 46.7% by Mukharjee (1971).

There was an increase in incidence of retinopathy with advancing age and the incidence was maximum in age group of 61 to 70 years. This is in agreement with the observations of Mukharjee (1971), Abou khatwa (1963) and Scott (1951).

Males were affected almost twice in comparision to females (32.75% and 17.6% respectively). There was a definite increase in incidence of retinopathy with increasing duration of diabetes and the incidence
was maximum among diabetics having diabetes for more than 10 years (40%). This is in accordance with the observations of Martensson and Palm (1950) and Scott (1951). 68.18% (15 out of 22) diabetics with retinopathy had hypercholesterolaemia and there was an increase in its incidence with increasing values of serum cholesterol. Cholesterol levels were higher in diabetics with retinopathy, particularly in the cases which were associated with nephropathy, in comparison to control group and diabetics without retinopathy (p<0.01). This is in accordance with the results of Keiding et al (1952), Demanet et al (1959), Lowy and Barach (1957) and Suri et al (1979). Hyperlipoproteinaemia was present in 45.45% cases and type IV hyperlipoproteinaemia was commonest abnormality detected. Srivastava et al (1979) and Suri et al (1979) have also observed type IV hyperlipoproteinaemia as commonest abnormality in diabetics with retinopathy.

Nephropathy was observed in 50.0% (11 out of 22) diabetics with retinopathy in comparison to only 13.2% (3 out of 53) diabetics without retinopathy. This shows close association between nephropathy and retinopathy. This is in accordance with the observations of Wagner (1945), Pathania and Sachar (1961), Vaishnav (1971) and Gupta et al (1960). They also observed a close association of retinopathy and nephropathy in diabetics.
Peripheral vascular disease was observed in 48.0% of diabetics (36 out of 75). This incidence is too high than the incidence reported in literature but almost similar incidence has been observed by Agarwal et al (1979) 49.1% and Nigam et al (1980) 46.1%, who included latent peripheral vascular disease (diagnosed by low second toe digital pressure) in it. On excluding the cases which were diagnosed on the basis of low second toe digital pressure, the incidence of peripheral vascular disease came down to 14.66% (11 out of 75) which is similar to the incidence reported by Bryfogle and Bradley (1957) and Lewis and Symons (1950). The higher incidence of peripheral vascular disease in present study might be due to the inclusion of latent peripheral vascular disease diagnosed by low second toe digital pressure.

There was increase in incidence of peripheral vascular disease with advancing age. This is in agreement with the results of Bell (1960) and Mukharjee (1971). Gangrene was observed in 4 cases and incidence of gangrene was 5.8%, 11.76% and 12.5% for 5th, 6th and 7th decades which is in accordance with the observations of Bell (1960) and Mukharjee (1971).

Males were affected more frequently than females. This is in agreement with the incidence observed
by Mukharjee (1971). There was a definite increase in incidence of peripheral vascular disease with increasing duration of diabetes and it was maximum in diabetics with diabetes of more than 10 years (80.0%). This is in agreement with the results of Brandman and Redisch (1953) and Oakley et al (1974).

86.1% of diabetics with peripheral vascular disease had hypercholesterolaemia and serum cholesterol levels were significantly higher in comparison to control group (p<0.01). This is in agreement with the observations of Suri et al (1979). There was a close association between microangiopathy and peripheral vascular disease. Similar correlation has been observed by Vaishnav et al (1967). Hypertension was more commonly associated in diabetics with peripheral vascular disease than in diabetics without peripheral vascular disease. This is in agreement with the observation of Brandman and Redisch (1953).

MICROANGIOPATHY

Microangiopathy was present in 48 diabetics (84.0%) and this incidence was significantly higher than the incidence in control group (20%). Similar observations have been reported by Handerson et al (1962), Moor et al (1966) and Vaishnav et al (1977). There was increase in incidence with advancing age. This is in agreement with the results
of Vaishnav et al (1966), Jordon and Pearley (1972) and Kilo et al (1972). There was an increase in incidence of microangiopathy with the duration of diabetes. This is in accordance with the observations of Pardo et al (1972), Kilo et al (1972), Larsson (1967), Mcmillan et al (1966), Aagenaes et al (1961) and Jordon and Pearley (1972).

43 out of 48 (89.6%) had hypercholesterolaemia and serum cholesterol levels were significantly high in comparison to control group. Type IIa was commonest hyperlipoproteinaemia among diabetics with microangiopathy.

There was a close association of microangiopathy and peripheral vascular disease. This is in agreement with the observations of Vaishnav et al (1967). Retinopathy and nephropathy was associated in 29.16% and 20.88% of cases respectively.