INTRODUCTION
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"The incidence of retinal, arterial and renal complications in long standing diabetes, constitutes the greatest unsolved problem in the management of this disease."


In the pre-insulin era (prior to 1922) the prognosis for life was only one and half years for the juvenile diabetic. It was a sort of martyrdom, for practically all of them succumbed to diabetic coma (Lichtenstein 1945). With the insulin therapy but prior to the discovery of chemotherapy for infection, the average duration of life increased to seven years followed by death from septicaemia (Joslin 1959). Now with insulin plus chemotherapy, the prognosis is better than two-thirds of normal life expectancy. Among a total of 20237 diabetic deaths from 1937 to 1964, the percentage of patients with duration of life exceeding 20 years has increased almost three times from 12.6% to 35.1% (Entmacher et al, 1964 Joslin Clinic & Metropolitan Life Insurance Company, New York, U.S.A).

The chronic complications of diabetes can occur in both the growth-onset and the maturity-onset diabetics. These complications are multiple and often occur one after the other in the same patient and effect many parts of the body, e.g. premature heart disease, kidney disease, blindness, painful neuropathy, amputation of foot and leg, impotence,
foetal loss and increased incidence of congenital anomaly in the offspring; all these are said to pose major problems. (Isenberg et al, 1965).

With the advent of insulin and consequent lengthening of diabetic life, diabetic retinopathy leading to blindness and nephropathy resulting in renal failure, have become problems of ever increasing importance (Joslin Clinic 1960-1964; Entmancher et al 1964).

The prognosis for treated diabetics as a group is relatively favourable but for many individuals it is devastatingly unsatisfactory. The mortality rate for diabetic patients as compared to that of non-diabetic patients remains high (Mark 1963). Today, most diabetic patients in developed countries die directly or indirectly from vascular disease. For all vascular diseases the mortality among diabetic males is about 2\(\frac{1}{2}\) times and among diabetic females it is about 3\(\frac{1}{2}\) times that of general population. Renal vascular deaths show by far the greatest excess (about 17 times) that in the general population (Joslin et al 1959).

The generalised angiopathy expresses itself, both in large arteries as those supplying the heart, extremities and in smaller blood vessels such as the arterioles, venules and capillaries (Marble 1965). It is said that microangiopathy, although it affects vessels throughout the body, is seen most forcibly in the eyes and the kidneys (Bloodworth 1963 and Banson et al 1964).
Microangiopathy and infections are said to be the chief culprits in contributing to morbidity and mortality among the diabetic patients in daily practice and as such it has become a challenge and stimulus to research.

The role of infection in aggravating microangiopathy is not clearly understood (Younger 1965). In some of the series reported in the West, (vide infra), the incidence of clinical pyelonephritis was found to be low i.e. 2% for males and 12% for females, as compared to the autopsy incidence of about 40.8% for adults and juvenile diabetics (Joslin 1959). The increased incidence of pyelonephritis noted at autopsy compared to clinical studies pointed to the importance of urinary tract infection in contributing to the terminal event and this led to a search for early diagnosis of infection in the kidneys in the living patient.

Urinary tract infection is a much more common complication in diabetes than it is generally believed to be. Many a time the infection is present without any constitutional symptom or symptoms referable to the urinary tract. It is likely that many cases of urinary tract infection in diabetics go undetected as patients never complain. Besides, pyuria and bacilluria occur intermittently, and a casual examination may give negative results. (Sathe 1960).

Kass (1960) reported an incidence of asymptomatic bacteriuria of 4% in males and 6% in females in the general population and 5% in diabetic males and 18% in diabetic females.
Diabetic renal disease plays a significant role in the production of morbidity and mortality of diabetics today. Pyelonephritis is a preventible disease and if this can be detected early, the course of a diabetic can be attenuated to a great extent.

As a large majority of diabetics in our country are poorly controlled and inadequately treated due to underdeveloped economic conditions prevailing in India, we were interested to know how far diabetes and its various complications (including urinary tract infection/pyelonephritis) differed from those of Western & other series, wherein the diabetics are said to be better controlled and adequately treated.

It is the purpose of this thesis, therefore, to find out the incidence of nephropathy and renal infection by employing a battery of biochemical, bacteriological and radiological studies.