SUMMARY AND CONCLUSION

The present study began with 80 adult albino rats of both sexes (60 females and 20 males). The animals were divided into 4 equal groups each comprising 15 females and 5 males. The first group served as controls and its animals were injected with distelled water, the remaining groups served as experimentals as follows:-

- Females and males of the first experimental group were injected with a freshly prepared aqueous solution of the diabetogenic agent Streptozotocin in a single dose of 40mg/kg body weight one week before mating.

- Only females of the second experimental group were injected with the diabetogenic agent.

- Only males of the third experimental group were injected with Streptozotocin.

The offspring of each group were further subdivided into 3 subgroups (A, B and C) according to their ages (2, 4 and 12 weeks respectively). As well, and according to the random blood glucose level, the offspring were divided into diabetic (200 mg/dL or more), non-diabetic hyperglycemic (>120 <200 mg/dL) and non-diabetic normal (< 120 mg/dL).

For each animal, biochemical investigation (blood glucose concentration measurement), chromosomal study (direct metaphase smears from bone marrow cells), mitotic index evaluation, histological study (morphological and morphometric) and quantitative study (statistical analysis of the volumetric data using the *t* distribution test and the Z test) were done.

The results showed the following:

- SZ was able to induce significant and irreversible hyperglycemia in all injected adult animals.

- The offspring of diabetic mothers (experimental groups I and II) exhibited hypoglycemia during the early weeks of postnatal life (age of 2 weeks) and then hyperglycemia from the age of 4 weeks and thenceafter.

- The offspring of experimental group III were analogous to their age corresponding controls.

- The chromosomal anomalies were virtually higher in diabetic subgroups but this increase in the rate of abnormalities was statistically non-significant.

- The diabetic offsprings (blood glucose > 200 mg/dL) exhibited significantly lower proliferation indices. However, non-diabetic hyperglycemic offsprings showed non-significant differences from their age corresponding controls.
- Histological changes concerning β and α-cells were directly proportional with the level of blood glucose. Beta cells showed pyknotic and karyorrhexic nuclei, hydropic degenerative changes in their cytoplasm, and lastly ballooning and complete loss of the cell. Alpha cells, on the other hand, showed extensive eosinophilia with diabetic animals; indicating accumulation of secretion in their cytoplasm.
- Morphometric study of β-cells showed that their nuclei were enlarged significantly in a trial cope with the state of hyperglycemia. Finally, the cells were exhausted and their nuclei showed the different stages of degeneration.

In conclusion, the present investigation provided an evidence that hyperglycemic milieu found surrounding the foetuses during their intrauterine life might affect their β-cells colonies and result in the production of endocrine pancreatic mass which is unefficient in producing the required amounts of insulin. However, paternal diabetes was found to be of negligible effect. Accordingly maternal health and care of prediabeties and diabeties must take a prime importance in its regulation and control during the earliest weeks of pregnancy or preceding pregnancy if possible.