CASE REPORTS

A CASE OF DIABETES MELLITUS IN A YOUNG INFANT

BY

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Diabetes mellitus occurring in the neonatal period has so seldom been reported that the following case seems worthy of record.

The patient was a female child, aged twenty-five days, born of healthy parents, with no family history of diabetes. The mother, aged twenty-four years, had had two previous pregnancies ; in both cases birth was premature. The first child is alive and well, aged two years ; the second died within a few hours of birth.

The third child, the subject of this communication, was also born prematurely, in the twenty-eighth week of pregnancy. This apparently was normal in every respect and labour was easy and spontaneous. At birth the baby seemed healthy, cried immediately, was quite vigorous and sucked well. She is said to have weighed only 3 lb. In spite of apparently adequate breast feeding, the child failed to thrive and became weaker and at one week she was unable to suck and was put on to spoon feeding, at first on breast milk and later on a sweetened, condensed milk. She never took well, however, being unable to swallow more than 2 to 3 teaspoonfuls at each feed. She became extremely weak and emaciated, and at twenty-five days was admitted to hospital, having been vomiting persistently during the two previous days.

On admission, the child was grossly emaciated and dehydrated and weighed only 1.02 kgm. Respiration was shallow, the temperature subnormal, the pulse imperceptible and the heart sounds almost inaudible. She was not deeply comatose as she responded feebly to painful stimuli, but she could not suck and could only swallow with difficulty. The umbilicus was clean, no abnormal physical signs were detected in chest or abdomen and there was no otitis media. A tentative diagnosis was made of prematurity with marked feebleness.

The child was wrapped in cotton-wool and kept under an electric blanket. All disturbance was avoided ; frequent small feeds were given by pipette and these were swallowed with difficulty but retained.

Several hours after admission a specimen of urine was obtained and was found to contain albumin : it gave a strong reduction of Benedict's solution and the phenyl glucosazone test was positive. The blood-sugar was 542 mgm. per cent. The child died shortly after this observation was made and before any attempt could be made to treat the diabetic condition.

Post-mortem examination was carried out by Dr. Guthrie fourteen hours after death. A gross macroscopic hypoplasia of the pancreas was found, the organ weighing only 1.06 gm., whereas normally the pancreas in the newborn child weighs about 3 gm. On microscopic examination a great diminution in the number of islets of Langerhans was found, with no evidence of inflammatory changes in the pancreas. Owing to post-mortem degeneration, it was impossible to get any information about the histo-pathology of the islet tissue. The only other abnormal findings were terminal broncho-pneumonia and mild gastro-enteritis.

Comment

The clinical and post-mortem findings in this case point almost certainly to it being one of true diabetes mellitus. The hypoplasia of the islet tissues observed cannot be attributed to the prematurity, as Nakamura (1924) has shown that the islet tissue normally makes its appearance about the thirteenth week and attains its greatest development by the sixth to seventh month of foetal life.

Discussion

Study of the literature on this subject shows that diabetes in the neonatal period is extremely rare.

Lawrence and McCance (1931) described a case of an infant which developed a spreading gangrene at the age of fourteen days, and four days later was found to have marked glycosuria, with blood-sugar of 600 mgm. per cent. The child recovered, after massive insulin therapy, and four weeks later showed a normal sugar tolerance. They regarded this as a true case of diabetes mellitus, but in view of the rapid and complete recovery, this seems hardly justified. They then reviewed the literature on diabetes in infancy. They stated that they would regard as established, (a) cases showing marked diabetic symptoms (thirst, polyuria, wasting) with heavy glycosuria, even if hyperglycaemia was not established, and (b) cases showing recurrent hyperglycaemia of over 200 mgm. per cent. even in the absence of diabetic symptoms. They cited seven cases described as diabetes in infants under one month, and accepted only two of these as proven. One of these was a case described in 1852 by Kitselle (his own child), who appeared well at birth but at fifteen days showed thirst, polyuria and glycosuria, and thereafter became emaciated and died at the age of six months. The second was a case described by Ramsay (1926); it was a child aged three weeks with glycosuria and marked diabetic symptoms. The child recovered after treatment with insulin and four years later was well and showed normal sugar tolerance.

Lewis and Eisenberg (1935) described a further case. A female child, aged eleven days, with double otitis media and slight bullous impetigo, was found to have a glycosuria and a blood-sugar of 520 mgm. per cent. She died several days later, in spite of insulin treatment. At post-mortem examination a congenital deficiency of the islet tissue of the pancreas was discovered, along with several inflammatory processes (pneumonia, impetigo, and otitis media), nephritis and a congenital cardiac lesion with general passive venous congestion.

Limper and Miller (1935) described a case in an infant of three weeks. This child had developed spreading gangrene of the leg at eleven days and at three weeks was found to have glycosuria with a blood-sugar of 900 mgm. per cent. It was moribund by this time, and in spite of insulin treatment died within a

few hours. At post-mortem examination an acute degenerative lesion of the islet tissue was found, also extensive arterial thrombosis, involving the aorta and many of its branches, which was apparently not due to umbilical sepsis, although this was present.

Of these five cases there can be little doubt that three of them were examples of true diabetes. In the case described by Kitselle (1852) symptoms persisted till death ; in that of Lewis and Eisenberg (1935) there was congenital deficiency of the islet tissue ; while in the case described by Limper and Miller (1935) there was acute degeneration of the islet tissue. The other two cases are not so convincing. That of Lawrence and McCance (1931) recovered completely in four weeks and it may be that the glycosuria was dependent on toxæmia arising from the gangrene of the leg, while the fact that Ramsay's case recovered completely in six weeks and was quite well four years later makes it doubtful if it was a case of true diabetes mellitus. It is interesting to note the similarity of the patient described by Lewis and Eisenberg with the one described in this communication.

The following table summarizes the findings in the above cases :

TABLE 1

CASE	AGE WHEN DETECTED (DAYS)	GLYCO-SURIA	BLOOD-SUGAR, MGM. PER CENT.	FATE	POST MORTEM
Lawrence and McCance (1931).	18	+	600	Recovered	—
Kitselle (1852) ..	15	+	—	Died at 6 months	—
Ramsay (1926) ..	21	+	225	Recovered	—
Lewis and Eisenberg (1935).	11	+	520	Died	Hypoplasia of islet tissue.
Limper and Miller (1935).	3	+	900	Died	Acute degeneration of islet tissue. Arterial thrombosis. Gangrene.
Devine (1937) ..	25	+	542	Died	Hypoplasia of islet tissue.

Summary

A case of diabetes mellitus occurring in a child aged twenty-five days is described. Post-mortem examination revealed marked hypoplasia of the islet tissue of the pancreas. From a review of the literature it appears that only three other unequivocal cases of neonatal diabetes have been reported.

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