HEALTHY LOW BIRTH WEIGHT INFANTS

GLUCAGON TOLERANCE TESTS

Most of the infants remain in the uterus long enough but some do not achieve expected birth weight and size. These infants are smaller than expected for the gestational age because of the antenatal growth retardation as a result of pathological processes primarily involving the foetus, the placenta or the mother.

Occasionally the cause of perinatal death in few of the infants had been associated with hypoglycaemia and some of the hypoglycaemic infants were of low birth weight (Brown and Wallis, 1963; Neligan, Robson and Watson, 1963; Cornblath, Wybregt, Baens and Klein, 1964; Neligan, 1964). An attempt has been made here to evaluate the hepatic glycogen stores and glucose output both on the first day (within two to three hours after birth) and on the eighth day in 15 low birth weight infants. None of these infants had any signs of hypoglycaemia.

RESULTS:

Tables 18 and 19 represent the results of the mean concentrations of plasma glucose, inorganic phosphorus, potassium, urea and total amino acid introgen (TAN) before and after glucagon administration on the first day and on the eighth day of life respectively. The net increases in plasma glucose concentrations are summarised in Table 20. Fig. 6a represents the behaviour of the above mentioned parameters after glucagon administration, while the Fig. 7a illustrates the trend of the net increases in plasma glucose concentrations.

First day:

The basal plasma glucose concentration is found to be 36.9 ± 2.60 (mean ± S.E.) mg./100 ml. This level although is less, but not significantly lower than that observed in the normal group.

The magnitude of the net increases in plasma glucose concentrations at 20, 40 and 60 minutes are comparable to those observed in the full-term normal infants at similar intervals.

The maximum level of 85.1 ± 5.81 (mean ± S.E.) mg./100 ml. is attained at 90 minutes after glucagon administration with a net rise of 48.2 ± 5.64 (mean ± S.E.) mg./100 ml. The magnitude of net increase observed in this group corresponds well with that seen in the normal group.

At 150 minutes the plasma glucose level of 53.6 ± 4.07 (mean ± S.E.) mg./100 ml. is observed with a net increase of 16.7 ± 5.36 (mean ± S.E.) mg./100 ml. This net increase is lower than that observed in the full-term normal infants on the first day of life.

The basal plasma inorganic phosphorus concentration is found to be 6.08 ± 1.04 (mean ± S.D.) mg./100 ml. The level gradually declines upto first 60 minutes and then shows negligible upward trend at 90 and 120 minutes. A significant fall of 0.90 mg./100 ml. is seen at 150 minutes ($t = 2.43$; $.02 < P < .05$). This maximum fall is somewhat more than that observed in the normal infants on the first day.

The basal plasma potassium concentration is found to be 5.56 ± 0.76 (mean ± S.D.) mEq/L. The maximum fall of 0.61 mEq/L. is observed at 60 minutes. Upward trend is then observed during the rest of the tolerance period.

The basal plasma urea concentration is found to be 18.0 ± 7.79 (mean ± S.D.) mg./100 ml. The level shows a gradual rising trend throughout the glucagon tolerance tests. A significant increase of 6.7 mg./100 ml. over the initial level is observed at 150 minutes ($t = 2.18$; $.02 < P < .05$).

The basal plasma TAN concentration is found to be 6.48 ± 2.25 (mean ± S.D.) mg./100 ml. Maximum fall of 1.49 mg./100 ml. is observed at 60 minutes. No appreciable increase is found during the rest of the tolerance period.

Eighth day:

The basal plasma glucose concentration of 53.8 ± 3.55 (mean ± S.E.) mg./100 ml. is found on the eighth day of life. This level is significantly higher than that observed in the low birth weight infants on the first day ($t = 3.09$; $P < .001$). However, the level is significantly lower than that observed in the normal infants on the eighth day ($t = 3.43$; $.001 < P < .01$).

Like normal and premature groups, comparitively rapid rise in seen in plasma glucose concentration at 20 and 40 minutes after glucagon administration. The net increase at 20 minutes is significantly more ($t = 3.45$; $.001 < P < .01$), however, that at 40 minutes is not.

Maximum plasma glucose level of 97.0 ± 4.56 (mean ± S.E.) mg./100 ml. is observed at 40 minutes with a net increase of 43.2 ± 4.44 (mean ± S.E.) mg./100 ml. No significant difference is observed between the net increases observed in the low birth weight and the full-term normal infants.

Net increase in the plasma glucose concentrations are significantly lower than those observed on the first day at 90 minutes ($t = 2.18$; $.02 < P < .05$), at 120 minutes ($t = 3.75$; $.001 < P < .01$) and at 150 minutes ($t = 2.44$; $.02 < P < .05$). Results of these observations indicate an increased rate of glucose disappearance on the eighth day as compared to that on the first day of life.

At 150 minutes, the level of 54.9 ± 4.28 (mean ± S.E.) mg./100 ml. is observed with a net increase of only 1.15 ± 2.93 (mean ± S.E.) mg./100 ml. over the initial level. This net increase is significantly more than that observed in the full-term normal infants at similar period ($t = 2.09$; $.01 < P < .05$).

The basal plasma inorganic phosphorus concentration on the eighth day is found to 5.81 ± 1.41 (mean ± S.D.) mg./100 ml. Maximum fall of 0.90 mg./100 ml. is observed at 60 minutes. No appreciable increase is seen thereafter upto 150 minutes.

The basal plasma potassium concentration on the eighth day is found to be 4.56 ± 0.78 (mean ± S.D.) mEq/L. which shows a slow fall, subsequently reaching a level of 3.81 ± 0.71 (mean ± S.E.) mEq/L. At 40 minutes, a significant fall of 0.75 mEq/L. in potassium concentration is noticed

($t = 2.34$; $.02 < P < .05$). This is followed by an upward trend except at 120 minutes, during the rest of the tolerance period.

The plasma urea concentration of 18.1 ± 10.25 (mean ± S.D.) mg./100 ml. is observed initially. The level then gradually increases upto 23.8 ± 10.78 (mean ± S.D.) mg./100 ml. with a net increase of 5.7 mg./100 ml. at 120 minutes. Negligible decrease is seen at the end of the glucagon tolerance tests.

The initial plasma TAN concentration is found to be 4.79 ± 1.57 (mean ± S.D.) mg./100 ml. The level then gradually recedes throughout the tolerance period. Significant decrease of 2.09 mg./100 ml. is observed at 150 minutes ($t = 3.07$; $.001 < P < .01$).

Le Dune (1972b) has recently reported the glucagon response in hypoglycaemic and non-hypoglycaemic small-for-date infants during the early postnatal period. Results of this author are summarised in Table 21, to represent the behaviour of blood glucose concentration after glucagon administration.

Le Dune (1972b) administered glucagon (30 µg./kg., i.m.) in both non-hypoglycaemic and hypoglycaemic infants with a view to try out the efficacy of glucagon treatment in hypoglycaemic infants. He administered glucagon between fourth and sixth hours of life and analysed blood specimen for blood glucose by glucose oxidase method at different time intervals upto 90 minutes. A maximum rise of 42.2 mg./100 ml. is observed in the blood glucose level in the non-hypoglycaemic group by the above

author. The results of the present series show a similar trend in the net increases in plasma glucose concentrations. The difference between these two 'populations' needs no comments.

DISCUSSION:

Resultant hyperglycaemia in response to glucagon administration in the low birth weight infants on the first day of life corresponds well with the responses obtained in the normal full-term and healthy premature infants in the present series. This indicates the adequate and similar hepatic glucose output in these infants on the first day of life.

Like full-term normal infants of the present series, quicker hyperglycaemic response is observed in these low birth weight infants on the eighth day emphasising an increase in the gluconeogenetic activity.

In contrast to the healthy premature infants of the present series, the hyperglycaemic response in the low birth weight infants on the eighth day is somewhat similar to that observed in the full-term normal infants at a similar age period, suggesting the adequacy of the hepatic glucose output.

Low hepatic glycogen stores were demonstrated by Shelley (1964) and Dawkins (1964) and low hyperglycaemic responses to glucagon administration (i.v.) were observed by Brown and Wallis (1963) Chance and Bower (1966), Cornblath and Schwartz (1966) and Le Dune (1972a) in cases of hypoglycaemia developing in the 'small for gestational age' (SGA) infants. Dawes (1968) reported that depletion of glycogen stores to less than 5 mg./G usually preceds the fall in blood sugar concentration. The adequacy of hepatic glucose output in the healthy,

nonhypoglycaemic low birth weight infants (Le Dune, 1972b; present series) and a tendency to maintain the minimal blood glucose level at the cost of glycogen stores in the hypoglycaemic infants (Shelley and Neligan, 1966), do not favour that the higher incidence of hypoglycaemia in the low birth weight infants is on account of poor glycogen stores. Furthermore, the findings of low glycogen stores in the infants who developed hypoglycaemia does not necessarily mean that poor glycogen stores are responsible for the development of hypoglycaemia. Hypoglycaemia may be induced by some other factors and during the genesis of this condition, the liver glycogen stores are likely to be depleted, thus accounting for low hyperglycaemic responses to glucagon in the hypoglycaemic infants reported by the above authors.

TABLE 18.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS, POTASSIUM, UREA AND TOTAL AMINO ACID NITROGEN CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE FIRST DAY (within 2 to 3 hours) OF LIFE AFTER GLUCAGON (30 µg./kg., i.m.) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucagon administration					
		20	40	60	90	120	150
Glucose (mg./100 ml.)							
Mean	36.9	56.1	72.7	83.8	85.1	72.2	53.6
S.E.±	2.60	3.10	3.88	5.74	5.81	4.37	4.07
Range	22-57	37-77	54-94	46-115	37-131	29-96	20-87
No.	15	15	15	15	15	15	15
Inorganic phosphorus (mg./100 ml.)							
Mean	6.08	5.62	5.48	5.42	5.46	5.47	5.18
S.D.±	1.04	0.94	0.99	1.08	1.07	1.22	0.83
Range	3.7-7.1	3.4-6.8	3.3-6.7	3.4-6.6	3.2-6.9	3.2-6.9	3.5-6.3
No.	13	13	13	13	13	13	13
Potassium (mEq/L.)							
Mean	5.56	5.12	4.97	4.95	5.08	5.12	5.26
S.D.±	0.76	0.79	0.73	0.74	0.73	0.64	0.56
Range	4.6-6.7	4.0-6.3	3.8-6.0	3.9-6.2	4.1-6.5	4.3-6.0	4.6-6.4
No.	12	12	12	12	12	12	12
Urea (mg./100 ml.)							
Mean	18.0	19.8	21.2	22.8	23.6	24.5	24.7
S.D.±	7.79	7.66	7.87	7.34	7.74	7.37	7.85
Range	7-29	8-30	10-33	11-32	9-33	12-33	9-36
No.	13	13	13	13	13	13	13
Total amino acid nitrogen (mg./100 ml.)							
Mean	6.48	5.61	5.24	4.99	5.03	5.22	5.24
S.D.±	2.25	2.25	2.40	2.05	2.17	2.10	2.40
Range	3.0-10.6	2.6-9.4	2.1-8.7	1.6-8.1	1.7-8.1	2.1-9.0	1.6-9.3
No.	13	13	13	13	13	13	13

TABLE 19.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS, POTASSIUM, UREA AND TOTAL AMINO ACID NITROGEN CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE EIGHTH DAY OF LIFE AFTER GLUCAGON (30 µg./kg., i.m.) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucagon administration					
		20	40	60	90	120	150
Glucose (mg./100 ml.)							
Mean	53.8	86.5	97.0	95.1	82.5	63.8	54.9
S.E.±	3.55	3.41	4.56	5.59	7.64	4.96	4.28
Range	38-82	65-107	71-120	57-124	42-122	33-93	28-87
No.	13	13	13	13	13	13	13
Inorganic phosphorus (mg./100 ml.)							
Mean	5.81	5.35	5.04	4.91	4.95	4.93	4.96
S.D.±	1.41	1.33	1.27	1.34	1.19	1.17	1.05
Range	3.4-7.6	3.5-7.5	3.7-7.4	2.6-7.2	3.1-7.1	3.1-6.9	3.6-6.7
No.	11	11	11	11	11	11	11
Potassium (mEq/L.)							
Mean	4.56	3.96	3.81	3.90	3.99	3.94	4.04
S.D.±	0.78	0.70	0.71	0.83	0.80	0.86	0.84
Range	3.0-5.9	2.3-4.8	2.3-4.7	2.0-5.2	2.1-5.1	2.1-4.8	2.7-5.0
No.	11	11	11	11	11	11	11
Urea (mg./100 ml.)							
Mean	18.1	19.8	21.0	21.7	23.4	23.8	23.2
S.D.±	10.25	11.05	10.31	10.11	9.94	10.78	10.53
Range	7-38	8-41	9-42	12-43	12-40	12-45	12-46
No.	11	11	11	11	11	11	11
Total amino acid nitrogen (mg./100 ml.)							
Mean	4.79	4.11	3.63	3.29	3.00	2.76	2.70
S.D.±	1.57	1.88	1.67	1.50	1.60	1.70	1.63
Range	2.4-7.4	2.0-7.6	1.7-6.8	1.2-6.6	1.1-6.2	0.7-5.8	0.7-5.5
No.	11	11	11	11	11	11	11

TABLE 20.

INCREASE IN THE PLASMA GLUCOSE CONCENTRATIONS (mg./100 ml.) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE FIRST (within 2 to 3 hours) AND EIGHTH DAY OF LIFE AFTER GLUCATON (30 µg./kg., i.m.) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucagon administration					
		20	40	60	90	120	150
First day (within 2 to 3 hours)							
Mean	36.9	19.2	35.8	46.9	48.2	35.3	16.7
S.E.±	2.60	2.03	3.86	5.21	5.64	5.08	5.36
Range	22-57	3-41	6-53	8-82	7-98	-1 to 68	-10 to 51
No.	15	15	15	15	15	15	15
Eighth day							
Mean	53.8	32.7	43.2	41.3	28.7	10.0	1.15
S.E.±	3.55	3.28	4.44	5.48	7.19	4.26	2.93
Range	42-82	16-55	18-74	3-78	-12 to 76	-12 to 47	-16 to 24
No.	13	13	13	13	13	13	13

TABLE 21.

BLOOD GLUCOSE CONCENTRATIONS (mg./100 ml.) AFTER GLUCAGON ADMINISTRATION IN HYPOGLYCAEMIC AND NON-HYPOGLYCAEMIC SMALL-FOR-DATE INFANTS. (REPRESENTATIVE DATA FROM LITERATURE)

Author & (Year)	Infants	Glucagon dose		Fasting level	Minutes after glucagon administration 10	20	45	60	90	Maximum blood glucose
Le Dune (1972)	Non-hypoglycaemic group	30 µg./kg. i.m.	Mean	31.0	40.2	51.2	66.4	70.2	64.9	73.2
			S.D.±	9.6	11.6	14.4	17.0	19.4	21.3	19.5
			Range	22-57	25-68	30-82	31-90	32-95	29-105	82-105
			No.	17			17			
			Net increase (calculated)	-	9.2	20.2	35.4	29.2	33.9	42.2
	Hypoglycaemic group	30 µg./kg. i.m.	Mean	10.2	17.9	24.3	34.9	30.9	29.3	35.3
			S.D.±	5.3	10.8	16.0	18.7	18.2	16.1	19.8
			Range	5-20	5-38	5-50	5-66	5-68	5-54	5-68
			No.	15			15			
			Net increase (calculated)	-	7.7	14.1	24.7	20.7	19.1	25.1

FIGURE 6a.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS, POTASSIUM, UREA AND TOTAL AMINO ACID NITROGEN CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE FIRST (▼- - -▼) AND EIGHTH (▽- - -▽) DAY OF LIFE AFTER GLUCAGON (30 µg./kg., i.m.) ADMINISTRATION.

FIGURE 6b.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS AND POTASSIUM CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE SECOND (▼- - -▼) AND EIGHTH (▽- - -▽) DAY OF LIFE AFTER GLUCOSE (2.5 G/kg., oral) ADMINISTRATION.

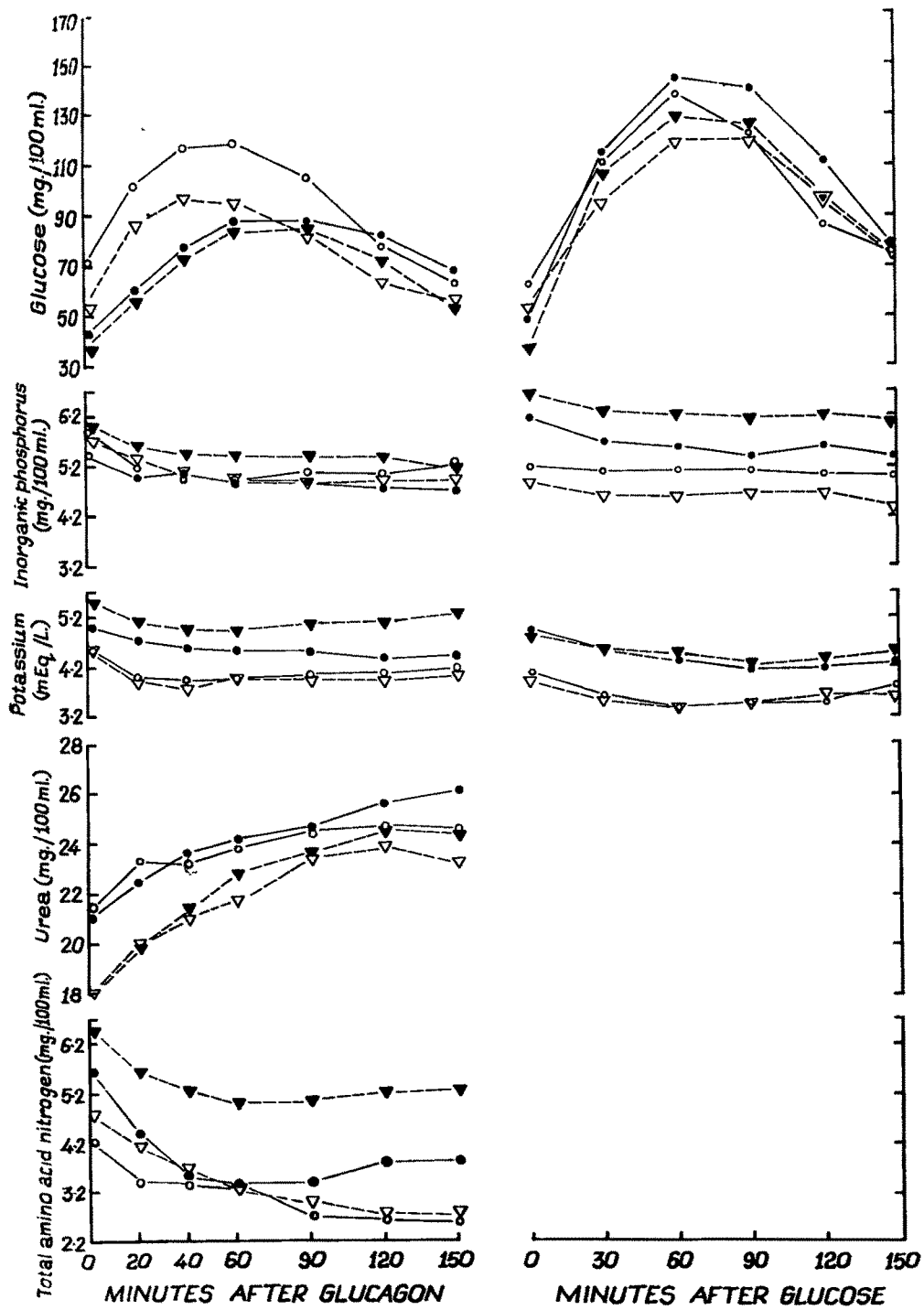
Glucose (mg./100 ml.)
170
150
130
110
90
70
50
30
Inorganic phosphorus (mg./100 ml.)
6·2
5·2
4·2
3·2
Potassium (mEq./L.)
5·2
4·2
3·2
Urea (mg./100 ml.)
28
26
24
22
20
18
Total amino acid nitrogen (mg./100 ml.)
6·2
5·2
4·2
3·2
2·2
0 20 40 60 90 120 150
MINUTES AFTER GLUCAGON
0 30 60 90 120 150
MINUTES AFTER GLUCOSE

Fig. 6a. 6b.

FIGURE 7a.

INCREASE IN PLASMA GLUCOSE CONCENTRATIONS (Δ mg./100 ml.) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE FIRST (▼----▼) AND EIGHTH (▽----▽) DAY OF LIFE AFTER GLUCAGON (30 µg./kg., i.m.) ADMINISTRATION.

FIGURE 7b.

INCREASE IN PLASMA GLUCOSE CONCENTRATIONS (Δ mg./100 ml.) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE SECOND (▼---▼) AND EIGHTH (▽----▽) DAY OF LIFE AFTER GLUCOSE (2.5 G/kg., oral) ADMINISTRATION.

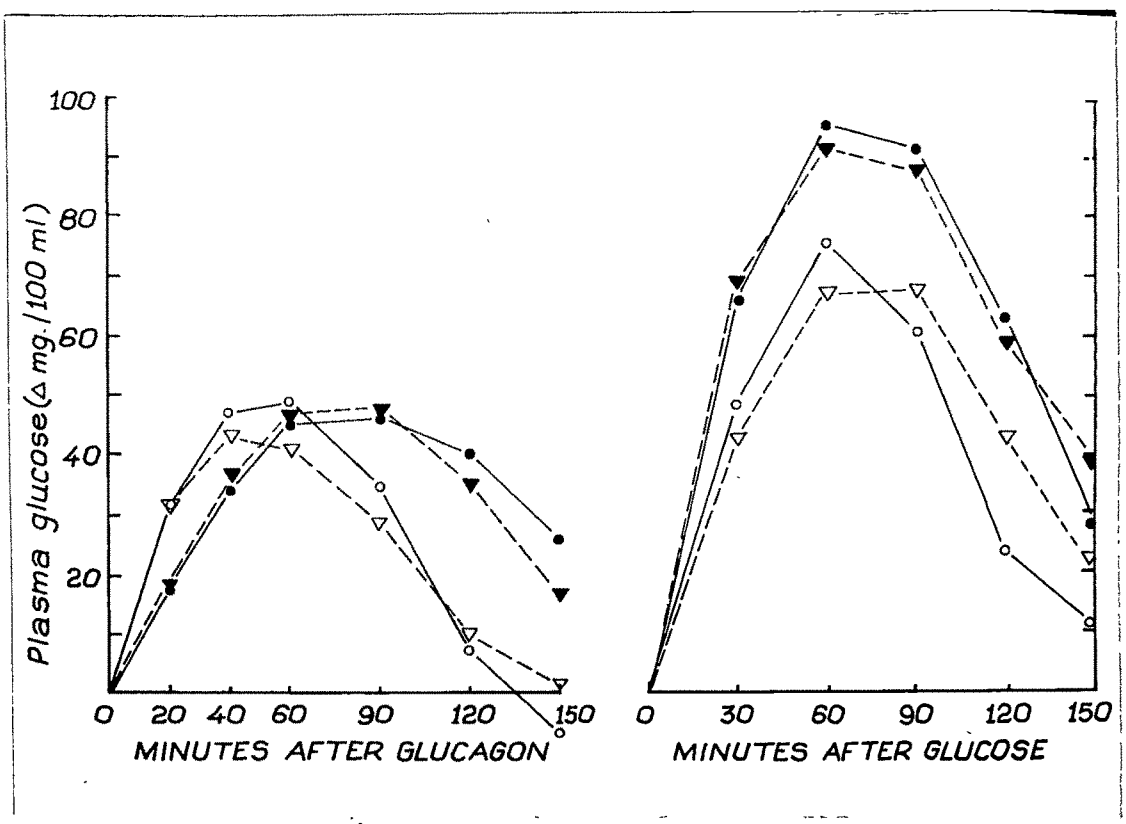
100
80
60
40
20
Plasma glucose (Δ mg./100 ml.)
0 20 40 60 90 120 150
MINUTES AFTER GLUCAGON
0 30 60 90 120 150
MINUTES AFTER GLUCOSE

Fig. 7a. 7b.

GLUCOSE TOLERANCE TESTS

The change in the rate of glucose disappearance seems to be one of the important parameters in counterpoising the homeostatic balance of blood glucose regulation. Serial oral glucose tolerance tests were carried out with a view to study the rate of glucose disappearance in the low birth weight infants during the early neonatal period, both on the second and eighth days of life.

RESULTS:

Tables 22 and 23 represent the results of the mean plasma glucose, inorganic phosphorus and potassium concentrations before and after glucose administration on the second and eighth days of life respectively. The net increases in the plasma glucose concentrations after oral glucose load are shown in Table 24. Fig. 6b shows the behaviour of the above mentioned parameters in the low birth weight infants after glucose load, while Fig. 7b represents the net increases in the plasma glucose concentrations.

Second day:

The basal plasma glucose concentration of 37.7 $\pm$ 2.22 (mean $\pm$ S.E.) mg./100 ml. is observed on the second day of life. This level is significantly lower than that seen in the full-term normal infants ($t = 2.64$; $.01 < P < .02$).

The level then gradually increases in almost similar manner which could be compared to that of the normal infants.

Maximum level of 129.1 ± 12.22 (mean ± S.E.) mg./100 ml. is attained at 60 minutes with a net rise of 91.4 ± 10.40 (mean ± S.E.) mg./100 ml. Decrease in plasma glucose is then observed and at the end of the glucose tolerance test, i.e. at 150 minutes the mean concentration of plasma glucose is found to be 76.5 ± 12.25 (mean ± S.E.) mg./100 ml. with a net increase of 38.8 ± 10.70 (mean ± S.E.) mg./100 ml. over the basal level.

The initial plasma inorganic phosphorus level on the second day is found to be 6.65 ± 0.70 (mean ± S.D.) mg./100 ml. The level gradually recedes during the entire tolerance period. Maximum fall of 0.54 mg./100 ml. is seen at 150 minutes.

The basal plasma potassium level is found to be 4.91 ± 0.90 (mean ± S.D.) mEq/L. Maximum fall of 0.72 mEq/L. is seen at 90 minutes. The level then shows a rise throughout the tolerance period.

Eighth day:

The basal plasma glucose concentration is found to be 52.2 ± 3.53 (mean ± S.E.) mg./100 ml. At 30 minutes a level of 95.4 ± 8.50 (mean ± S.E.) mg./100 ml. is observed with a net increase of 43.2 ± 5.88 (mean ± S.E.) mg./100 ml. This increase is significantly less than the increase seen on the second day of life in the low birth weight infants ($t = 4.02$; $P < .001$). All other net increases over the mean basal level on the eighth day are less than those observed on the second day of life in the same infants.

The maximum plasma glucose level of 120.5 ± 11.58 (mean ± S.E.) mg./100 ml. is attained with a net incfease of 68.3 ± 9.45 (mean ± S.E.) mg./100 ml. at 90 minutes after glucose administration.

At 150 minutes the plasma glucose attains a level of 72.7 ± 8.15 (mean ± S.E.) mg./100 ml. This level is higher than the initial basal level by 20.5 ± 8.26 (mean ± S.E.) mg./100 ml.

The initial plasma inorganic phosphorus level is found to be 4.89 ± 1.14 (mean ± S.D.) mg./100 ml. Irregular pattern is observed during the tolerance period. The maximum fall of 0.53 mg./100 ml. is observed at 150 minutes.

The plasma potassium concentration at the initiation of the glucose tolerance is found to be 3.95 ± 0.77 (mean ± S.D.) mEq/L. At 60 minutes a maximum fall of 0.57 mEq/L. is observed. The level then shows a gradual upward trend during the rest of the tolerance period.

Representative data as regards the behaviour of blood/plasma glucose and/or phosphorus and potassium concentrations in response to oral glucose administration in the low birth weight infants during the neonatal period are not available from the literature.

DISCUSSION:

The behaviour of the mean plasma glucose level after oral glucose administration in the low birth weight infants show a trend similar to that observed in the full-term normal infants on the second day of life. However, five infants (Nos. L 6, L 8, L 9, L 10 and L 12 - Appendix II) showed divergence from the above pattern. Poor hyperglycaemic responses are observed in these five infants (33.3%). Gentz et al. (1969) in their study of SGA infants demonstrated interesting results. Maximum plasma insulin levels (one peak response) were obtained within five minutes following acute intravenous glucose administration in four out of the 20 SGA infants. These authors correlated their findings with the observations of Kanazawa, Kuzuya, Ide and Kosaka (1966) who, in the dog experiments demonstrated the relation between one peak insulin (pancreatic vein plasma) response and an improved rate of glucose disappearance, in contrast to that between a polyphasic insulin response and slower rate of glucose disappearance after an intravenous glucose load. Senterre and Karlberg (1970) demonstrated that the oxygen uptake of the small-for-date babies is initially lower, but rises during the first five days of life. Sinclair and Silverman (1966) measured oxygen consumption from second to tenth day of life and showed that the increased rate of oxygen consumption (hypermetabolism) is related to the degree of 'undergrowth' in respect of the gestational age. Size of the brain in the low birth weight infants is comparatively

larger(25 to 35 per cent)than that of the normal newborn infant (Gruenwald, 1967). The larger brain may demand more glucose for its metabolic activities. The lower responses observed in these five infants in the present series could be due to (i) earlier insulin release mechanism as observed by Gentz et al. (1969), (ii) hypermetabolism (Sinclair and Silverman, 1966) or (iii) an increased demand by the brain (Gruenwald, 1967). It is very difficult to pinpoint the exact mechanism at this age period, when multiple factors are operating.

The rate of glucose disappearance on the eighth day of life, as evidenced by the behaviour of net increases in the plasma glucose levels is improved as compared to that on the second day of life. However, it is significantly less than that observed in the full-term infants on the eighth day of life. This somewhat deficient rate of glucose disappearance on the eighth day is suggestive of an inadequate hormonal homeostatic mechanism between insulin and its antagonists.

TABLE 22.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS AND POTASSIUM CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE SECOND DAY OF LIFE AFTER GLUCOSE (2.5 G/kg., oral) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucose administration				
		30	60	90	120	150
Glucose (mg./100 ml.)						
Mean	37.7	107.0	129.1	125.6	96.2	76.5
S.E.±	2.22	10.03	12.22	13.83	13.94	12.25
Range	23-56	37-181	46-225	48_212	28-179	21-146
No.	14	14	14	14	14	14
Inorganic phosphorus (mg./100 ml.)						
Mean	6.65	6.30	6.24	6.15	6.22	6.11
S.D.±	0.70	0.70	0.74	0.80	0.69	0.68
Range	5.6-7.5	5.2-7.2	4.6-7.2	5.0-7.3	5.3-7.1	5.2-7.4
No.	13	13	13	13	13	13
Potassium (mEq/L.)						
Mean	4.91	4.55	4.38	4.19	4.32	4.48
S.D.±	0.90	1.05	1.25	1.05	0.87	0.61
Range	3.2-6.6	3.2-6.3	3.4-5.8	2.9-6.4	3.2-6.0	2.9-5.5
No.	13	13	13	13	13	13

TABLE 23.

PLASMA GLUCOSE, INORGANIC PHOSPHORUS AND POTASSIUM CONCENTRATIONS (MEAN) OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE EIGHTH DAY OF LIFE AFTER GLUCOSE (2.5 G/kg., oral) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucose administration				
		30	60	90	120	150
Glucose (mg./100 ml.)						
Mean	52.2	95.4	119.5	120.5	95.8	72.7
S.E.±	3.53	8.50	10.01	11.58	9.35	8.15
Range	28-75	48-168	69-204	71-215	63-171	35-149
No.	12	12	12	12	12	12
Inorganic phosphorus (mg./100 ml.)						
Mean	4.89	4.62	4.61	4.67	4.68	4.36
S.D.±	1.14	1.18	1.14	0.98	1.02	1.26
Range	3.6-6.7	3.0-6.8	3.3-6.5	3.3-6.7	3.3-6.7	3.6-6.5
No.	10	10	10	10	10	10
Potassium (mEq/L.)						
Mean	3.95	3.61	3.38	3.49	3.57	3.64
S.D.±	0.77	0.77	0.73	0.78	0.71	0.79
Range	2.7-5.0	2.3-5.0	2.0-5.0	2.0-5.0	2.3-4.6	2.0-4.6
No.	10	10	10	10	10	10

TABLE 24.

INCREASE IN THE PLASMA GLUCOSE CONCENTRATIONS (mg./100 ml.)OF THE HEALTHY LOW BIRTH WEIGHT INFANTS ON THE SECOND AND EIGHTH DAY OF LIFE AFTER GLUCOSE(2.5 G/kg., oral) ADMINISTRATION. (PRESENT SERIES)

	Basal level	Minutes after glucose administration				
		30	60	90	120	150
Second day						
Mean	37.7	69.3	91.4	87.9	58.5	38.8
S.E.±	2.22	3.32	10.40	11.70	11.86	10.70
Range	23-56	13-125	22-169	24-156	-9 to 123	-16 to 118
No.	14	14	14	14	14	14
Eighth day						
Mean	52.2	43.2	67.3	68.3	43.6	20.5
S.E.±	3.53	5.88	7.7	9.45	7.00	8.26
Range	28-75	14-93	22-129	24-140	2-113	-26 to 91
No.	12	12	12	12	12	12