ABSTRACTS

Bloom, S.R.; Vaughan, N.J.A.; and Russell, R.C.G. (Middlesex Hosp., London, England): VAGAL CONTROL OF GLUCAGON RELEASE IN MAN. Lancet *2*: 546-49, September 1974.

It has been proven that the islets of Langerhans are anatomically supplied by autonomic nerve fibers. In 1973 Iverson showed that acetylcholine perfusion of the isolated dog pancreas caused an immediate large release of glucagon. In the present studies, neural control of pancreatic glucagon was assessed in man. An infusion of 15 μg./kg. of atropine over two minutes in nine fasting normal subjects was associated with a decrease in immunoreactive plasma glucagon and an increase in pulse rate but no change in blood glucose or immunoreactive insulin over a thirty minute period. When the same group of persons was atropinized and then infused for thirty minutes with arginine in a dose of 0.5 gm./kg. over thirty minutes, there was a 33 per cent reduction in glucagon secretion as compared to values obtained when saline was substituted for atropine. In another study, hypoglycemia was induced by intravenous insulin administration, and glucagon responsiveness was measured. Ten patients with duodenal ulcer, eleven patients with selective vagotomy, and ten patients with truncal vagotomy were compared. Insulin-induced hypoglycemia was associated with an increase in plasma glucagon from a mean fasting level of below 50 pg./m. to more than 170 pg./m. in unoperated duodenal ulcer patients and ulcer patients who had undergone selective vagotomy. There was only a modest increase in glucagon in the patients who had undergone truncal vagotomy. The study shows that there is significant vagal mediation of glucagon secretion in man. It suggests that truncal vagotomy may result in reactive hypoglycemia because it may block central nervous system-mediated glucagon release. Selective vagotomy for ulcer preserves C.N.S.-vagal-alpha cell control, and this procedure should be preferred. T.G.S.

Cherrington, Alan D.; and Vranic, Mladen (Dept. of Physiol., Univ. of Toronto, Toronto, Canada): EFFECT OF INTERACTION BETWEEN INSULIN AND GLUCAGON ON GLUCOSE TURNOVER AND FFA CONCENTRATION IN NORMAL AND DEPANCREATIZED DOGS. Metabolism *23*:729-44, August 1974.

Concurrent insulin and glucagon release stimulated by arginine has been shown to increase glucose production (Ra) and utilization (Rd) in normal dogs. The present study examined the effects obtained with elevations of glucagon and insulin achieved in normal dogs by glucagon infusion and in depancreatized dogs by administering graded increments of insulin with glucagon until the metabolic response coincided with that observed in the normal animals. In both normal and depancreatized dogs a marked increase in glucose turnover was associated with concurrent elevations of glucagon and insulin. Glucagon had no influence on glucose clearance in depancreatized dogs maintained on basal insulin. Glucagon-induced Ra was not inhibited by high rates of concurrent insulin infusion, although the effect of glucagon on Ra decreased with time, demonstrating that a given insulin/glucagon ratio did not have a sustained effect. In the depancreatized animals, normal glucose turnover and FFA concentrations were achieved when the normal IRI response to glucagon was reproduced by insulin infusion. The gluconeogenic effect of glucagon was demonstrated by the increased rate at which ^{14}C-glucose was recycled in these animals. C.R.S.

Corrall, R.J.; Hunter, W.M.; Campbell, I.W.; Harrower, A.D.B.; Duncan, L.J.P.; and Clarke, B.F. (Royal Infirmary and Med. Res. Council, Radioimmuno-assay Unit, Edinburgh, Scotland): REVERSAL BY INSULIN TREATMENT OF ABNORMAL GROWTH HORMONE PATTERN IN NEWLY DIAGNOSED DIABETES MELLITUS. Acta Endocr. 77:115-21, September 1974.

Growth hormone levels measured throughout a sixteen hour day were found to be markedly elevated in five newly diagnosed insulin-dependent male diabetics and showed a significant fall, although still considerably elevated above normal, after one to two months of insulin therapy. These results suggest that the elevated growth hormone levels seen in diabetics are the result of the altered carbohydrate metabolism rather than the cause. R.R.

Crockett, Samuel E.; Marsh, David; Lewis, Richard P.; and Tzagournis, Manuel (Dept. of Intern, Med., Divs. of Endocr. and Metabol. and Cardiol., The Ohio State Univ., Columbus, Ohio): LACK OF CARDIAC INOTROPIC EFFECT OF TOLBUTAMIDE IN INTACT MAN. Metabolism *23*:763-69, August 1974.

The effects of acute tolbutamide administration in man were investigated by the use of sensitive measurements of systolic time intervals. In diabetic patients treated for one week with 1.5 gm. of tolbutamide orally no positive inotropic effect was observed. The intravenous administration of 1 gm. of tolbutamide in nondiabetic subjects likewise showed no significant inotropic action. C.R.S.

Garber, A.J.; Menzel, P.H.; Boden, G.; and Owen, O.E. (Dept. of Med. and Fels Res. Inst., Temple Univ. Health Sciences Center, Philadelphia, Pa.): HEPATIC KETOGENESIS AND GLUCONEOGENESIS IN HUMANS. J. Clin. Invest. *54*:981-89, October 1974.

Splanchnic uptake of various substrates and release of ketone bodies (acetoacetate and beta-hydroxybutyrate) and glucose were determined in five patients undergoing a cardiac catheterization after a three-day fast; the method employed a simultaneous determination of aortic and hepatic vein substrate concentrations together with a measure of hepatic blood flow. Production of ketone bodies was 115 gm. per twenty-four hours, which is as great as that previously reported after five to six weeks of starvation; thus, the trebling of ketone levels during prolonged fasting appears to be the result of the observed decrease in muscle utilization of ketones rather than increased ketone body production. Splanchnic release of glucose was 123 gm. per twenty-four hours; the gluconeogenic precursors—lactate, pyruvate, glycerol, and amino acids—could account for 81 per cent of glucose produced. R.R.

Kamm, Donald E.; Strope, Gerald L.; and Kuchmy, Barbara L. (Depts. of Med., Rochester Gen. Hosp. and Univ. of Rochester Sch. of Med. and Dentistry, Rochester, N.Y.): RENAL CORTICAL AND HEPATIC PHOSPHOENOLPYRUVATE CARBOXYLASE IN THE DIABETIC RAT: EFFECT OF ACID-BASE STATUS. Metabolism *23*:1073-79, November 1974.

Phosphoenolpyruvate carboxylase (PEPC) activity was determined in renal cortex and liver from diabetic rats given sodium chloride (acidotic) and sodium bicarbonate (nonacidotic) and in normal animals given ammonium chloride or sodium bicarbonate. PEPC activity was elevated in renal cortex and liver in diabetic acidosis but returned to normal in the renal cortex after adminis-

tration of sodium bicarbonate. Increments in renal PEPC activity following ammonium chloride in normals or in acidotic diabetic animals were similar for any given reduction in plasma carbon dioxide. It was concluded that the increase in hepatic PEPC is secondary to the defect in carbohydrate metabolism, while in the renal cortex the increase in PEPC activity during diabetes is secondary to acidosis and is independent of the defect in carbohydrate metabolism. C.R.S.

Niki, Atsushi; Niki, Hatsumi; Miwa, Ichitomo; and Okuda, Jun (Dept. of Intern. Med., Sch. of Dentistry, Aichigakuin Univ., and Dept. of Clin. Biochem., Faculty of Pharmaceutical Science, Meijo Univ., Nagoya, Japan): INSULIN SECRETION BY ANOMERS OF D-GLUCOSE. Science *186*:150-51, October 11, 1974.

Verbatim summary. Isolated rat islets were incubated for five minutes in the media containing either the α or β anomer of D-glucose (2 mg. per milliliter). The amounts of secreted insulin and changes of anomer ratio were concomitantly determined. In spite of rapid mutarotation, significantly greater stimulation of insulin secretion was observed by α-D-glucose than by β-D-glucose.

Pagliara, Anthony S.; Stillings, Susan N.; Hover, Barbara; Martin, Duane M.; and Matschinsky, Franz M. (Edward Mallinckrodt Depts. of Pharmacol. and Pediat., Washington Univ. Sch. of Med.; St. Louis, Mo.): GLUCOSE MODULATION OF AMINO-ACID-INDUCED GLUCAGON AND INSULIN RELEASE IN THE ISOLATED PERFUSED RAT PANCREAS. J. Clin. Invest. *54*:819-32, October 1974.

Glucose- and amino-acid-induced glucagon and insulin release were studied in the isolated perfused rat pancreas. The study showed that (1) glucagon and insulin were both secreted at a low basal rate, (2) a biphasic pattern of glucagon release to amino acids as well as for insulin was identified, (3) there was a graded stimulation of insulin and glucagon release to arginine or an amino acid mixture, (4) physiologic glucose concentrations (5 mM) markedly augmented insulin release and inhibited glucagon release induced by arginine or an amino acid mixture, and (5) the threshold glucose concentration for glucagon inhibition was lower than for insulin release, the first phase for both being more sensitive to glucose than the second phase. The authors discuss these data with reference to the postulate that there are receptors for both glucose and amino acids in the pancreatic alpha and beta cells. RR.

Peracchi, M.; Reschini, E.; Cantalamessa, L.; Giustina, G.; Cavagnini, F.; Pinto, M.; and Bulgheroni, P. (First Inst. of Clin. Med. and Second Inst. of Med. Path., Univ. of Milan, Milan, Italy): PRELIMINARY REPORT: EFFECT OF SOMATOSTATIN ON BLOOD GLUCOSE, PLASMA GROWTH HORMONE, INSULIN, AND FREE FATTY ACIDS IN NORMAL SUBJECTS AND ACROMEGALIC PATIENTS. Metabolism *23*:1009-15, November 1974.

Somatostatin, administered by infusion, lowered the plasma growth hormone (GH) and IRI levels in seven acromegalic patients. There was no effect observed on blood glucose, while plasma free fatty acid levels were increased. In normal subjects, somatostatin inhibited plasma GH and IRI responses during an arginine-stimulation test. Similarly, hypoglycemia-induced GH release was blocked by somatostatin in two normal subjects. C.R.S.

Rado, Janos P.; Szende, Laszlo; and Marosi, Judit (Isotopic Dept. and Metabolic Unit, Janos Hosp., Budapest, Hungary): INFLUENCE OF GLYBURIDE ON THE ANTIDIURETIC RESPONSE INDUCED BY 1-DEAMINO-8-D-ARGININE VASOPRESSIN (DDAVP) IN PATIENTS WITH PITUITARY DIABETES INSIPIDUS. Metabolism *23*:1057-63, November 1974.

Glyburide was demonstrated to have a diuretic action in six patients with diabetes insipidus ingesting an ad-libitum fluid intake. Graded doses of arginine vasopressin were administered and produced a progressive decrease in the diuretic action of glyburide. The antidiuretic action of arginine vasopressin was significantly decreased by simultaneous administration of glyburide. Apparently, glyburide competitively inhibits the action of vasopressin, and its diuretic action in patients with diabetes insipidus may be mediated through inhibition of the peripheral action of residual antidiuretic hormone. C.R.S.

Walter, Robert M.; Dudl, R. James; Palmer, Jerry P.; and Ensinck, John W. (Dept. of Med., Univ. of Washington Sch. of Med., Seattle, Wash.): THE EFFECT OF ADRENERGIC BLOCKADE ON THE GLUCAGON RESPONSES TO STARVATION AND HYPERGLYCEMIA IN MAN. J. Clin. Invest. *54*:1214-20, November 1974.

There are conflicting data concerning the effect of the adrenergic system on glucagon secretion; in this study the effects of alpha and beta receptor blockade with phentolamine and propranolol, respectively, did not modify the augmented glucagon levels seen during an eighty-four-hour fast and during insulin-induced hypoglycemia in healthy nonobese young men. Thus, the adrenergic system does not appear to modulate glucagon secretion during fasting or insulin-induced hypoglycemia. R.R.

Weindling, Howard; and Henry, John B. (Dept. of Pathology, Upstate Medical Center, State Univ. of New York, Syracuse, N.Y.): LABORATORY TEST RESULTS ALTERED BY "THE PILL." J.A.M.A. *229*:1762-68, September 1974.

This is a review of the metabolic effects of oral contraceptives. It contains concise and up-to-date information regarding the various metabolic alterations that occur following the oral administration of the pill. These include the physiologic effects on the renin-angiotensin system, which sometimes leads to hypertension, the occasional side effects of hepatic dysfunction, changes in binding proteins leading to changes in serum adrenal steroid concentration, and alterations in thyroid function tests. The influence of the oral agents on carbohydrate metabolism and lipid metabolism and the occasional effects on the hematologic system are also mentioned. This is an excellent review for the practicing physician on the metabolic alterations that occur in patients on oral contraceptives. C.M.C.

Erratum

The paper "Persisting Enhanced Proinsulin-insulin and Protein Biosynthesis (^{3}H-Leucine Incorporation) by Pancreatic Islets of the Rat after Glucose Exposure," by P. Zucker and J. Logothetopoulos, in DIABETES 24: 194-200, February, 1975, omitted a phrase on page 198. The full heading of table 2, column 3, should read "Leucine conc. (n moles per 150 μl.) in incubation medium."