Brief Notes and Comments

Fatal Venous Thrombosis in Hyperosmolar Coma

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SUMMARY

In many reported cases of hyperosmolar coma venous thrombosis was found, but no laboratory diagnosis was attempted in order to confirm or detect the thrombotic phenomena.[1-3] The following is a report of a case of hyperosmolar coma in which signs of intravascular clotting appeared during the course of the illness and the patient died of massive pulmonary embolism. DIABETES *20*:308-09, May, 1971.

CASE REPORT

A forty-two-year-old woman was admitted in coma. Diabetes mellitus had been diagnosed three years previously and since then she had received 500 mg. of Diabinese daily. One month prior to admission she had discontinued the medication (apparently because of a depressive state). Three days prior to admission she experienced extreme thirst, polydypsia and polyuria. During the course of the day of her admission, she gradually lapsed into coma and was then sent to the hospital. Physical examination revealed an obese, dehydrated female who responded only to painful stimuli. Blood pressure was 120/70, pulse rate was ninety per minute and regular. The remainder of the physical examination was negative. Urinalysis revealed 4+ glucose, but no acetone or protein. Plasma glucose was 1,200 mg./100 ml., urea 150 mg./100 ml., bicarbonate 21 mEq./L., sodium 150 mEq./L., potassium 3.8 mEq./L. The hematocrit was 55 per cent and serum osmolality was 439 mOsm./kg.

During the first twelve hours she received 140 units of Regular insulin and twelve liters of 0.45 normal saline intravenously. Her state of consciousness improved rapidly and within twelve hours she was fully conscious and able to answer questions. On the second day the peripheral thrombocyte count was 70,000 m^3, prothrombin time was prolonged to 30 seconds (normal 13 seconds), plasma fibrinogen was 175 mg./100 ml. (with the biuret method used in our laboratory the lower limit of normal is 250 mg./100 ml.) and fibrinogen split products were 110 μg./ml. as compared to normal 3-7 μg./ml.[4] On the third day of hospitalization the blood concentrations of urea and glucose were within normal limits. The patient felt well until the sixth day, when she suddenly collapsed and died.

Autopsy findings

The main branches of both pulmonary arteries were occluded by fresh emboli. Fresh hemorrhagic infarctions were found in both lower lobes, and there was congestion and emphysema in the lungs. The left renal vein was occluded by recent thrombus; both kidneys were congested, but no areas of infarctions were found.

DISCUSSION

The low plasma fibrinogen concentration, low thrombocyte count, marked increase of fibrinogen split products, and prolonged prothrombin time are generally accepted as evidence of intravascular clotting with consumption of clotting factors. Two major factors that increase the risk of intravascular clotting are vascular stasis and high concentrations of clotting factors in the blood. Both of these factors are likely to occur in severely dehydrated patients such as ours. Unilateral renal vein thrombosis is a rare phenomenon. Dehydration is considered to be an important cause of this condition in children, although experience in adults is very scarce.

The frequency of venous thrombosis in patients with hyperosmolar coma is stressed by Halmos et al.[1] who even suggest the prophylactic administration of heparin in this condition. To our knowledge there are no reports of early diagnosis or prophylactic therapy of intravascular clotting in this condition, however.

Because the hyperosmolar state would appear to favor the formation of thrombi, laboratory studies for early detection of intravascular clotting should be performed in all patients with this condition. The immediate institution of heparin therapy in cases with laboratory evidence of intravascular clotting may lead to a diminished mortality rate in this condition.

REFERENCES

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betic coma. Yearbook of Endocrinology, 1965-1966, pp. 165-81.

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ABSTRACTS

Angel, A.; Desai, K.; and Halperin, M. L. (Dept. of Med., Univ. of Toronto, Toronto, Ontario, Canada): FREE FATTY ACID AND ATP LEVELS IN ADIPOCYTES DURING LIPOLYSIS. Metabolism *20*:87-99, January 1971.

Measurement of intracellular FFA levels in isolated adipocytes was obtained by a technic employing labeled sucrose as an extracellular marker to determine the medium content of the packed adipose cell float, thus permitting correction for contamination by FFA bound to extra cellular albumin. The addition of norepinephrine rapidly increased the intracellular content of FFA. Release of FFA did not significantly depress adipocyte ATP levels. Addition of ATP levels by lipolytic hormones correlated inversely with intracellular accumulation of FFA. Glucose prevented intracellular accumulation of FFA. These results support the view that the fall in adipocyte ATP after treatment with lipolytic hormone is the result of FFA accumulation which depresses ATP synthesis by uncoupling oxidative phosphorylation. C.R.S.

Ashmore, J. (Univ. of Massachusetts Med. Sch., Worcester, Mass.): INSULIN AND ADRENERGIC RECEPTORS. Fed. Proc. *29*:1386-87, July-August 1970.

The effects of adrenergic drugs and adrenergic blockers on insulin secretion from pieces of rat pancreas were studied in a series of experiments. It was found that alpha adrenergic stimulation inhibited, while beta adrenergic stimulation increased insulin release. Further experiments dealt with the role of cyclic 3′-5′ AMP on these effects. Alpha adrenergic stimulation decreased, while beta adrenergic stimulation increased cyclic AMP production and insulin release. M.C.B.

Assaykeen, Tatiana, A.; Clayton, Patricia L.; Goldfein, Alan; and Ganong, William F. (Dept. of Surg. [Urology] & Pharmacol., Stanford Univ. Sch. of Med.; Dept. of Physiol., Med., Obstet.-Gynec., and Cardiovasc. Res. Inst., Univ. of California, San Francisco, Calif.): EFFECT OF ALPHA- AND BETA-ADRENERGIC BLOCKING AGENTS ON THE RENIN RESPONSE TO HYPOGLYCEMIA AND EPINEPHRINE IN DOGS. Endocrinology *87*:1318-22, December 1970.

In propranolol-treated dogs there was almost complete inhibition of the increase in renin secretion produced by insulin-induced hypoglycemia. With alpha-adrenergic blockade using phenoxybenzamine there was slight potentiation of renin response to hypoglycemia. The data suggest that epinephrine stimulates renin secretion via a beta-adrenergic receptor mechanism and that the stimulatory effect of hypoglycemia is mediated in part by the increase in circulatory epinephrine it produces. C.R.S.

Bajaj, J. S.; and Vallance-Owen, J. (Dept. of Med., Queen's University of Belfast, Belfast, Ireland): INSULIN ANTAGONISM OF NORMAL AND DIABETIC ALBUMIN AFTER LIVER PERFUSION. Lancet *1*:16, Jan. 2, 1971.

When albumin from diabetic subjects is incubated with rat diaphragm it inhibits the action of added insulin on glucose uptake by the rat diaphragm. If diabetic albumin is stored for four weeks it loses its insulin antagonism. In this study serum was obtained from ten diabetics and stored for four weeks. Livers from rats were then perfused with albumin from normal controls and albumin from diabetics which had been stored. It was found that liver perfusion with added insulin of diabetic albumin restored insulin and antagonism. The finding is in agreement with the hypothesis that the liver degrades insulin to its component A and B chains and that diabetic albumin but not normal albumin combines with the B chain to produce an insulin antagonist. T.G.S.

Beringer, A.; and Thaler, H. (First Med. Clinic, University of Vienna and Fourth Internal Medicine Division, Wilhelminenhospital, Vienna, Austria): THE RELATIONSHIP BETWEEN DIABETES MELLITUS AND FATTY LIVER. Germ. Med. Mth. *15*:615-18, October 1970.

To study the relationships between diabetes and fatty liver, liver biopsies were formed on 465 diabetics. The group consisted of 392 women and seventy-three men. Ninety-five per cent were maturity onset and were predominantly in the sixth to eighth decades of life. Almost 75 per cent of the cases were obese and control of the diabetes was considered ideal in only 9.5 per cent. The severity of steatosis was graded by histological appearance and there was no statistical relationship to the age of the subject, the duration of the diabetes, or the level of the fasting blood sugars. Approximately one third of the cases showed little or no fatty change and cirrhosis was observed in 2.6 per cent of all cases. There was a significant relationship between the degree of fatty change and the degree of obesity. The patients receiving insulin therapy (N=53), showed a significantly less degree of steatosis than those treated with diet or diet and oral agents.

The lack of nondiabetic age and weight matched controls, the single, rather crude criterion for fatty changes (admitted by the authors), and the lack of documentation of dietary habits all detract from the over-all significance of the study. J.E.V.

Birchwood, B. L.; Little, J. A.; Antar, M. A.; Lucas, C.; Buckley, G. C.; Csima, A.; and Kallos, A. (Dept. of Med., Dietetics, Biochem., Epidemiology, and Biometrics, St. Michael's Hosp., Univ. of Toronto, Toronto, Ontario, Canada): INTERRELATIONSHIP BETWEEN THE KINDS OF DIETARY CARBO-