15 amino acids identified in normal and in ulcerative colitis colon mucosa, an amino acid, alpha-epsilon diaminopimelic acid, was demonstrated in some samples of ulcerative colitis rectal and colon tissue. This finding may be related to the presence of metabolic products of gram-negative intestinal bacteria. The supernates of disintegrated suspensions of spherophorus necrophorus and lysozyme digests of spherophorus necrophorus or *B. proteus* contain a component reacting similarly to colon mucosa with ulcerative colitis serum, as demonstrated by positive hemagglutination and agar gel diffusion reactions. Incubation of alpha-epsilon diaminopimelic acid and gamma-aminobutyric acid, with pepsin hydrolysates of globulin and colon tissue, yielded complexes also reacting as antigens with ulcerative colitis serum.

1. Fifteen amino acids were identified in hydrolysates of normal and ulcerative colitis rectal and colon mucosa and submucosa. 2. Rectal and colon tissue from patients with ulcerative colitis may contain an additional amino acid; possibly alpha-epsilon diaminopimelic acid, not yet demonstrated in normal colon tissue. 3. Alpha-epsilon diaminopimelic acid, a component of the cell wall of intestinal microorganisms, and perhaps other metabolic products of intestinal microorganisms, may contribute to the antigenic potential of ulcerative colitis colon.

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Influence of Glucose Cycloacetoacetate and Its Hydrolysed Product on Capillary Resistance in Scorbutic Guinea Pigs. (29953)

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The characteristic increase in capillary fragility is one of the important manifestations of scurvy(1-5) which might implicate the internal haemorrhages in advanced cases of the disease. When ascorbic acid is administered to scorbutic animals capillary resistance is restored(4,6). Reppert *et al*(7) have suggested that ascorbic acid exerts this effect by inhibiting hyaluronidase thus causing increased accumulation of hyaluronic acid which is the cementing substance of endothelial lining. Glucose cycloacetoacetate (GCA), the glucose derivative obtained by condensation of glucose and ethyl acetoace-

tate(8), has earlier been found to be a precursor of vit C in germinating beans and rats (9-12). The additional significant finding is in respect to the enhancing effect of GCA on synthesis of glucuronic acid(13), which is known to be incorporated into hyaluronic acid(14). The unidentified product obtained from the acid hydrolysis of GCA (GCAh) has also been reported to possess important physiological properties similar to those of GCA(14,15). The present work, therefore, was undertaken to get an insight into the roles played by GCA and its hydrolysed product in maintenance of capillary resistance during the scorbutic condition.

Experimental. Healthy young guinea pigs (average weight 320 g) were divided in groups of 5 each. Group I was maintained on normal laboratory diet. Other groups were kept on the scorbutic diet(15). Group II received no drug and served as control. Group III was given daily intraperitoneal injections of 0.5 mg/guinea pig of ascorbic acid and served as a standard for comparison. Groups IV and V received 150 mg/kg of GCA and 25 mg/kg of GCAh, respectively.

Determinations of vascular resistance of the animals were made by the method of Zacho(16), with the help of the apparatus described by Lavollay and Neumann(17), daily for the period of 20 days after which the experiment was terminated. The pressure at which the petechiae appeared was taken as an index of vascular resistance. The growth rate was also recorded at 5 days interval during the experimental period.

Results. The effects of daily intraperitoneal administration of GCA, GCAh and ascorbic acid to scorbutic guinea pigs on their vascular resistance is graphically represented in Fig. 1. The vascular resistance of the animals in Group II (scorbutic) progressively declined over a period of 20 days. Administration of ascorbic acid (Group III) prevented this condition. Administration of GCA (Group IV) and GCAh (Group V) did not totally prevent this fall but first delayed the onset of the scorbutic condition, so far as vascular resistance is concerned and second, markedly decreased its severity. Fig. 2 shows that vit C could markedly prevent loss of weight in scorbutic animals. Weight loss

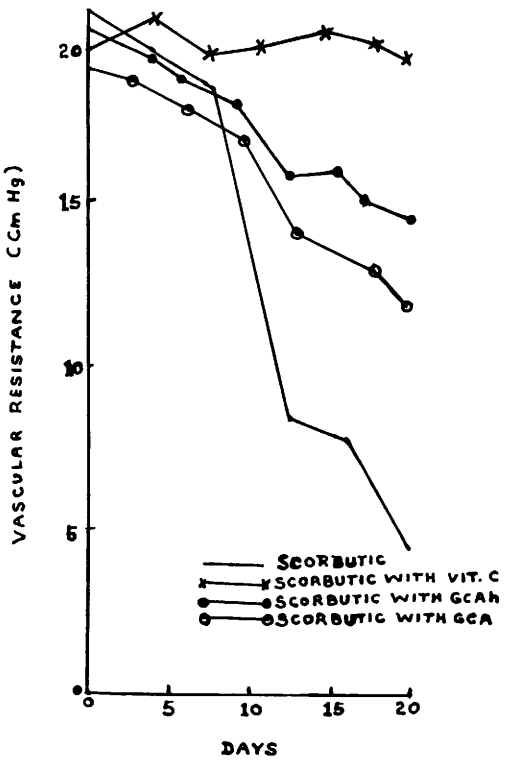

FIG. 1. Effect of GCA, GCAh and ascorbic acid on vascular resistance of scorbutic guinea pigs.

over a period of 20 days was less in GCAh and GCA treated animals than in scorbutic controls.

Discussion. Hyaluronic acid occurs in many of the connective tissues(18) and Gersh and Catchpole(19) reported that depolymerization of glycoprotein, which forms the important structure of the basement

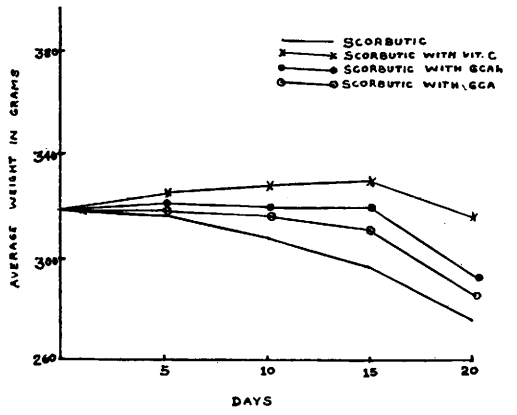

FIG. 2. Effect of GCA, GCAh and ascorbic acid on growth rate of scorbutic guinea pigs.

membrane surrounding the capillaries, occurs in scurvy and thus may lead to weakening of the capillary wall. Penney and Balfour (20) have suggested that failure in formation of mucopolysaccharides, which have been shown to be present in connective tissue of the capillaries(21), might result in weakening of the sheath and thus lead to hemorrhage. It now appears to be established that vit C maintains the capillary structure *via* increased synthesis of hyaluronic acid(22). Since GCA was found to augment the glucuronic acid synthesis it may be suggested that the compound might maintain capillary resistance by stimulating the synthesis of glucuronic acid and its subsequent utilization for formation of mucopolysaccharides. The effect of hydrolysed GCA on glucuronic acid synthesis is yet to be determined, therefore a similar mechanism to that of GCA on the capillary resistance cannot be postulated. Zweifach *et al*(22) have demonstrated that hyaluronidase when applied to the tissue of the rat causes bleeding. The alternative mechanism, whether GCA and GCAh would cause inhibition of hyaluronidase, remains to be elucidated.

Summary. 1. Daily intraperitoneal administration of GCA and GCAh to guinea pigs maintained on scorbutic diet delayed and decreased the severity of the reduction of vascular resistance. 2. Neither of the substances could totally prevent reduction of vascular resistance of the scorbutic guinea pigs at the doses administered.

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