Histological and histochemical study of the effect of hypervitaminosis a on the uriniferous tubule of adult albino rats

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Forty adult albino rats were utilized in this study.Some animals were injected with vitamin A either in a single extremely large dose to study the effect of acute hypervitam-inosis A or in multiple large doses for 1,2 and 3 months to show the effect of chronic hypervitaminosis A. Some of these injected animals were left for a period to study the effect of stoppage of vitamin A injection. Some rats were injected with arachus oil. The rest of animals served as controls.Parffin sections were prepared and stained with haematoxylin and eosin and the uriniferous tubules of the kidneys of all animals were studied histologically. Other sections were stained with periodic acid schiff to reveal the carbohydrate of different components of the uriniferous tubules and lastly periodic silver methenamine was performed to demonstrate the capillary mesangium, reticular fibres around blood vessels and the basement membranes of different structures. Cryostat sections were prepared to study the activity of alkaline phosphatase and adenosine triphosphatase enzymes.In the experimental part of this work; vascular dilata-tion and engorgement were observed in the glomerular capill-aries of the renal corpuscles in hypervitaminosis ”A” whether acute or chronic. The basement membrane of the glomerular capillaries,the parietal layer of Bowman’s capsules and the basement membrane of the proximal convoluted tubules, loopsof Menlo, distal and collecting tubules showed thickeningwhich was gradual in cases of prolonged chronic toxicity by over dosage of vitamin ”A”. The mesangium, the reticularfibres around blood vessels and the basement membranes of different tubular structures showed an increase in thickness which was marked after acute and prolonged chronic administ-ration of large doses of vitamin ”A”. This denoted that, thecarbohydrate content of the tissues increased under theeffect of acute and chronic hypervitaminosis ”A”.The activity of alkaline phosphatase in the glomeruli and tubules increased after acute and prolonged chronic exposure to large doses of vitamin ”A”. As well, the activity of adenosine triphosphatase in the glomeruli and wall of blood vessels increased markedly. However; a mild increase in the enzyme activity of the tubules after acute and prolonged chronic exposure to large doses of vitamin ”A” was observed. The increased activity of both enzymes denotes increased cellular activity of the tubular epithelium and increased glomerular function. This increased activity of the tubular epithelium, together with vascular dilatation and engorgement may explain the increased urine formation after vitamin ”A”injection.The return of the kidney to

the resting state after discontinuation of vitamin ”A” administration confirms its role in renal vasodilatation and hyperfunction, at the same time shows its non destructive action on these structures.