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Medical laboratory science

ANA 204

1. Critically determine the renal function of the desert dwellers and the anatomical basis of their unique adaptation.
2. Write extensively on the clinical importance of the glomerular filtration barrier.

Answers

1. The nephrons in desert mammal Camel are equipped with well developed Henle's loop and the number of juxtamedullary nephrons in kidneys is very high, about 35% (in man this number is about 15%).Desert mammals do not readily find water, hence they must excrete very less amount of water. They are able to produce highly concentrated urine.Henle's loop of juxtamedullary ( =adjacent to medulla of kidney) nephron goes deep down into the medulla. This is why medulla of camel's kidney is thicker than that of other mammals, but it is most well developed in another desert mammal, the kangaroo rats.

 The Henle's loops of juxtamedullary nephrons along with counter flowing blood vessels, called vasa recta, help in conservation of water.

**The anatomical basis of their unique adaptation:** The thicker medulla of small desert rodents could therefore be viewed as a desert adaptation superimposed on a basic body-size-dependent pattern. Most loops of Henle in desert rodents are of the juxtamedullary type, and the epithelial cells have densely packed mitochondria with more cristae per unit volume than a horse's loop of Henle.

1. Glomerular filtration barrier functions as a highly organised, semi-permeable membrane preventing the passage of the majority of proteins into the urine. Damage to the glomerulus by disease can allow passage through the glomerular filtration barrier of red blood cells, platelets and blood proteins such as albumin and globulin.