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1. ANATOMICAL BASIS OF DESERT DWELLERS UNIQUE ADAPTATION
   The anatomical structures for urine concentration found in animals living in desert are wide medullae, long loop of Henle, long proximal tubules, small renal corpuscles, extension of the renal pelvis, ultrastructure of Henle's loop, and epithelial changes in the collecting tubule. Renal blood and urinary flow rates are lower than in species with access to unlimited water supply. The juxtaglomerular apparatus components are topographically intimate for effective tubuloglomerular auto-regulation of renal blood flow.
   Apart from their ability to store water and concentrate their urine, desert dwellers have other unique features such as large ears for dissipating body heat, humps to store fat
   Renal function
   Kidneys of desert animals have a longer loop of Henle to make the animal's urine as concentrated as possible and limit the amount of water and salt they lose. This helps desert animals live for long periods of time on minimal amounts of water. The Henle's loops of juxtamedullary nephrons have the vasa recta which help in water conservation.

2. Clinical importance of Glomerular Filtration Barrier

   In health, the glomerular filtration barrier functions as a highly organized, semipermeable membrane preventing the passage of the majority of proteins into the urine. This barrier is composed of the glomerular basement, fenestrated endothelium the podocyte and the slit diaphragm between the podocyte.

   Diseases of the glomerular filtration barrier include alport syndrome and congenital nephrosis. They are genetic diseases of the glomerular capillary wall.

   -Alport syndrome is caused by mutations in genes coding for type IV collagen of the glomerular basement membrane. Cases of alport syndrome can be classified into X-linked and autosomal forms. Mutations in alport syndrome result in abnormal collagen chain composition and irregular ultrastructure of the glomerular filtration membrane. The typical clinical features of alport syndrome are progressive nephritis, sensorineural hearing loss, and ocular changes.

-Nephrosis of the Finnish type is a rare disease caused by mutations in genes encoding a cell adhesion protein nephrin. Nephrin is synthesized by podocytes and is localized at the slit diaphragm area of the glomerular capillary wall. Infants with nephrosis do not have major nonrenal malformations; however minor functional disorders in the central nervous system and cardiac hypertrophy are common during the nephrotic stage. Children with classical nephrosis of the Finnish type are treated successfully with active protein and nutritional support, followed by bilateral nephrectomy, dialysis and renal transplantation.