

Polycystic kidney disease in goldfish: a statistical review

Notes on my goldfish cases with polycystic kidney disease (PKD) (1994-2021). **Key points**

Number (n=20): total cases confirmed = 20 over 27-year period = less than one per year

Varieties: 60% comets, 35% commons = 95% long-bodied goldfish (5% = short-bodied oranda [1/20])

Environment: 75% outdoor pond, 15% indoor aquarium, 10% indoor pond

Age (yrs) where known (n=18): minimum 2yrs, maximum 10yrs, mean 6.2yrs

Colour: 35% white+ red/orange, 30% white, 25% orange/gold, 10% calico

NB. Older goldfish commonly lose orange colouration and turn white, so it is difficult to interpret the significance and whether white colouration was a factor or not.

Duration: minimum half day, maximum over 1 year, mean =5.2 months

Presentation: 85% swollen body, 37% buoyancy disorder, 15% skin oedema, 10% ulceration

NB. Some had a combination of clinical signs, and the degree of body swelling was often related to the size of the kidneys, and lack of swelling was often because PKD was a coincidental finding. Over half of the fish continued to eat and swim (relatively) normally.

Buoyancy: 37% had buoyancy disorder, most of which (71%) were on the bottom.

NB. In my review of goldfish cases with buoyancy disorder, 17% were due to PKD.

Swelling: the degree of swelling varied from none, when PKD was a coincidental finding and secondary to the primary problem, to severe and depended on the owner's degree of observation and desire to seek a professional opinion. The majority of cases (55%) had severe swelling.

Symmetry: 65% had asymmetrical body swelling; the remainder included those with no swelling.

NB. The degree of asymmetry depended on the relative size of each kidney.

Radiography (n=17): radiographic appearance depended on the degree of swelling of each kidney. All radiographs were taken with fish anaesthetised and out of water to achieve maximum radiographic detail. ALL fish had an increased amount of separation between the two swim bladder chambers. There was often a loss of radiographic contrast and coelomic tissue detail, resulting in a uniform, homogeneous radiopaque appearance, which was dependent on the size of the swollen kidneys. In cases with asymmetrical swollen kidneys, it was sometimes possible to see separate posterior margins on lateral radiographic views. The posterior chamber of the swim bladder was displaced ventrally in 53%, and displaced laterally in 24% where kidneys were asymmetrical, most of which were also displaced ventrally.

Ultrasound (n=5): ALL cases had multiple large fluid-filled cavities of irregular shape and size.

NB. The small number of cases is due to a lack of diagnostic expertise and scanner availability.

Sex (n=13): where gonads could be identified at necropsy, 69% were female and 31% were male.

Histopathology (n=11): NONE of the cases examined had parasites in the renal tissue.

NB. The last case sent for histopath was in Oct'03 because it was apparent that there was little benefit to understanding the pathology, or for diagnostic confirmation.