

Discovery of a new cure for parturient hemoglobinuria in buffaloes and cows

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Parturient hemoglobinuria (red water; colloquially known as *Rut Mootra*) is one of the major and economically important metabolic diseases of dairy animals in Pakistan, India, Egypt and elsewhere in the world. It is an acute disease of high yielding/pregnant buffaloes and cows characterized by hypophosphatemia, intravascular hemolysis, hemoglobinuria (reddish urine), anemia and death. Buffaloes in advanced pregnancy or within first few months of calving are particularly susceptible. The disease is far more common in buffaloes than in cows. In a survey conducted during 1996 in Punjab (Pakistan), 9% mortality due to hemoglobinuria in buffaloes was reported which translated into estimated annual losses of Rs. 490.0 millions. Given a steep escalation of prices of dairy animals over the past 19 years, the magnitude of current pecuniary losses associated with this disease may run into several billion rupees annually in Pakistan.

Standard treatment of parturient hemoglobinuria is based on parenteral and oral administration of sodium dihydrogen phosphate (NaH_2PO_4), popularly known as sodium acid phosphate. Response to sodium acid phosphate therapy can be described as variable at best and cure rate almost never exceeds 50%. Another flip side of the sodium acid phosphate therapy is that treated animals become off feed and thus sustain a considerable loss of body weight and milk yield. It follows that an alternative effective treatment without these side effects is warranted.

Taking cues from observation of Indian investigators (Chugh S.K., R.M. Bhardwaj and M.M. Mata, 1998. Lowered antioxidant status of red blood cells in post-parturient hemoglobinuria of buffaloes. *Vet. Res. Communication.*, 22: 385-388) that there is a significant decrease in antioxidant status in parturient hemoglobinuria affected animals, we recently tested the efficacy of an antioxidant therapy in the treatment of this disease. This *de novo* therapy is based on intravenous administration of 2.4 to 4g of N-acetylcysteine in 1 liter of 5% dextrose followed by a similar dose *per os* 12 hours later. Ten grams of vitamin C is also administered orally on daily basis. Of the 25 cows and buffaloes treated thus far with this regimen, 23 animals recovered and survived. In 2 animals, urine color returned to normal but death ensued as the animals were recruited for treatment at an advanced stage of the disease. A 2 days therapy with acetylcysteine + vitamin C generally suffices. This new treatment is bereft of any discernable untoward effect and considerably less costly than the standard treatment given *ut supra*. At the moment, results though seemingly encouraging and much better than those with standard therapy should be construed as preliminary only and lack the backing of carefully controlled scientific trials. As far as could be ascertained, the use of acetylcysteine (a potent antioxidant) has not as yet been evaluated in the treatment of parturient hemoglobinuria in cow and buffaloes anywhere in the world. The

investigations conducted thus far were in a private capacity. Investigations aimed at determining the mechanistic specificity of N-acetylcysteine through carefully controlled clinical trial in hemoglobinuria and other oxidative stress associated clinical disorders of animals are in the offing.