Anti-idiotype mimicking outer membrane proteins of Pasteurella multocida B:2 in the control of haemorrhagic septicaemia

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Haemorrhagic septicaemia (HS) is a fatal systemic disease of livestock most commonly affected are buffalo, cattle, pigs and camels, meanwhile all ungulates are equally susceptible. It is caused by a capsular strain of Pasteurella multocida type B:2 in southern Asia. Outer membrane proteins (OMPs) are virulent factor which remained less immunogenic due to low molecular weight and high lipoprotein contents, therefore anti-idiotypes were developed against P. multocida B:2. OMPs were extracted with 1% Sarkosyl method, the purified protein content obtained 21.3 mg/100 ml and idiotypes were raised in rabbits followed by anti-idiotypes in sheep. The fragments of antibody attachment (Fab) were separated through pepsin digestion and the idiotypes were adjuvanted in Montanide. P. multocida anti-idiotype 400 μg/100 kg body weight through S/C route was evaluated and compared with OMPs subunit alone and alum-adsorbed bacterin in buffaloes and cattle. It was recorded that OMPs-anti-idiotype vaccine induced high levels of geomean antibody titres (GMT) detected using indirect haemagglutination (IHA) test at 100th day post vaccination, buffaloes and cattle groups revealed the GMT antibody titre 147 and 137.2 respectively. The OMPs alone exhibited antibody titre of 137.2 in buffaloes and 119.4 in cattle. The bacterin showed least antibody titre both in buffaloes (27.9) and in cattle (32.0). Moreover, the OMPs anti-idiotype vaccine provoked better protection (100%) against homologous strain of P. multocida and humoral immunogenic response throughout till 370 days and the OMPs alone could achieved 67% protection at 160 th day post vaccination in cattle and buffaloes.