Richtmyer-Meshkov (RM) instability arises during the eruption of heavy gas cloud. In this study, we numerically study the effects of magnetic fields on the RM instability induced by the ionised cylindrical and spherical heavy gas cloud eruption using corner transport upwind + constrained transport algorithm. Our numerical results show that magnetic fields can suppress the formation of spike and bubble structures induced by the eruption in both cylindrical and spherical cases. The magnetic pressure of the interface along the perpendicular direction of magnetic field is the main factor to control the distortion of the interface. Even weak magnetic fields can drastically alter the evolution of the cloud and result in different distributions and amplifications of the magnetic pressure, which will affect further transformation of RM instability during the ionised gas eruption. Meanwhile, the magnetic pressure on the interface decreases gradually when the initial magnetic field is relatively large; when the initial magnetic field is small enough, the opposite results will occur.