Intranasal delivery of mesenchymal stem cell-derived exosomes reduces oxidative stress and markedly inhibits ethanol consumption and post-deprivation relapse drinking.

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Chronic ethanol consumption leads to brain oxidative stress and neuroinflammation, conditions known to potentiate and perpetuate each other. Several studies have shown that neuroinflammation results in increases in chronic ethanol consumption. Recent reports showed that the intra-cerebroventricular administration of mesenchymal stem cells to rats consuming alcohol chronically markedly inhibited oxidative-stress, abolished neuroinflammation and greatly reduced chronic alcohol intake and post deprivation relapse-like alcohol intake. However, the intra-cerebroventricular administration of living cells is not suitable as a treatment of a chronic condition. The present study aimed at inhibiting ethanol intake by the non-invasive intranasal administration of human mesenchymal stem cell products: exosomes, microvesicles (40 to 150 nm) with marked antioxidant activity extruded from mesenchymal stem cells. The exosome membrane can fuse with the plasma me