MicroRNA (miRNA) are small non-coding RNA that negatively regulate the transcription of many different target proteins. Altered miRNA expression has been reported in a number of neurodegenerative conditions including Parkinson's disease and Alzheimer's disease. This study examined miRNA expression in Multiple System Atrophy (MSA), an alpha-synucleinopathy characterized by the oligodendrocytic accumulation of alpha-synuclein. A number of miRNA were found to differ in the brains and blood of non-tg mice and a transgenic mouse model of MSA including miRNA-17, miRNA-18a and let-7g. miRNA expression was also found to differ between human brains from patients diagnosed with MSA, corticobasal degeneration and normal controls. The differential expression of miRNA and their subsequent downstream targets in these disorders provides a new avenue to examine the molecular aspects that underlie these disorders, which can appear clinically indistinct. The identification of differential miRNA expression profiles in the blood of patients with MSA, corticobasal degeneration or normal controls may led to the eventual use of these as biomarkers for the disorders allowing differential diagnosis in the clinic.