A single nucleotide polymorphism (SNP) of the XKR4 gene has been linked to Attention-Deficit/Hyperactivity Disorder (ADHD). This gene is preferentially expressed in cerebellum, a brain structure implicated in this disorder. This study investigated the effects of this SNP on cerebellar development in children with and without ADHD. We collected 279 longitudinal T1-weighted structural images and DNA from 58 children with ADHD and 64 typically developing (TD) children matched for age, IQ and gender. Groups were divided by the XKR4 rs2939678 single-nucleotide polymorphism (SNP) into A-allele carriers versus subjects homozygous for the G-allele. Cerebellar lobular volumes were segmented into 35 regions of interest using MAGeTBrain, an automated multi-atlas segmentation pipeline for anatomical MRI, and statistically analyzed using linear mixed models. We found decreased grey matter (GM) volumes in ADHD compared to TD children in bilateral lobules VIIIa, left VIIIb, right VIIB and vermis VI. Furthermore, we found a linear age by gene interaction in left lobule VIIB where subjects homozygous for the G-allele showed a decrease in volume over time compared to A-allele carriers. We further found quadratic age x gene and age x diagnosis interactions in left lobule IV. Subjects homozygous for the G-allele (the genotype overtransmitted in ADHD) showed more suppressed, almost flat quadratic growth curves compared to A-allele carriers, similar to individuals with ADHD compared to controls. However, there was no interaction between genotype and diagnosis, suggesting that any effects of this SNP on cerebellar development are not specific to the disorder.