Single-suture craniosynostosis occurs in approximately 1 in 2000 live births and has been associated with brain dysmorphology. It has been suggested that premature fusion of cranial sutures restricts and alters brain growth by limiting the space within the cranial vault, leading to the hypothesis that cognitive deficits result from reduced intracranial volume. Here we test the hypothesis that intracranial volumes and whole brain volumes in infants diagnosed with isolated sagittal synostosis differ from those of unaffected infants. Our study sample consisted of magnetic resonance images obtained from six infants with isolated sagittal synostosis, aged 11-37 weeks, and six age-matched unaffected infants. We collected measurements of intracranial volume and whole brain volume from the MRIs using Analyze 10.0® and are statistically compared the two groups using Mann-Whitney U tests. Our results show that infants with sagittal craniosynostosis show slightly increased whole brain volumes and slight decreases in intracranial volume relative to unaffected infants. However, neither of these differences were statistically significant. These findings suggest that the skull does not significantly constrict the brain in infants with sagittal synostosis, and that the mild cognitive deficits observed in these infants do not result from restriction of brain growth by the overlying skeletal system.