Suicidal behavior runs in families and is prevalent in adolescence. Case-control and family-based studies in this age group failed to find a genetic association that survived replications. Gene-environment approach gave new hope for possible associations especially with the short allele of the serotonin transporter promoter polymorphism (5HTTLPR). However, a recent meta-analysis raised doubts about the consistency of these findings. Some new structural and functional imaging data may shed light on the age-related and gender-related development of the brain. This review suggests a new approach to Gene-by-Environment and timing interaction to understand the interplay that leads to suicidality in adolescents and young adults.