Since the 1970s, the national twin birth rates have been increasing worldwide. Apart from the increasing childbearing age, the main cause is the use of assisted reproductive technologies (ART). To explore the overall consequences of dual embryo transfer (DET), the literature has been reviewed systematically regarding short- and long-term outcomes of IVF/ICSI twin pregnancies i.e. pregnancy complications, maternal risks, obstetric outcome and long-term morbidity including neurological sequelae, cognitive development and family implications. Another consequence of DET is vanishing twins, which seems to be a possible cause of adverse outcome in IVF singletons. The sparse literature on vanishing twins in IVF pregnancies and the influence on the surviving co-twin were also addressed. Finally, to determine the effects of implementing elective single embryo transfer (eSET), trials concerning eSET versus DET were analysed. In the light of the steadily increasing twin birth rates and the findings in this overview, where IVF/ICSI twins carry adverse outcome, it should be emphasized that the major obstacle in IVF remains the high twin birth rate. Furthermore vanishing twins account for another hazard of DET. These problems can be resolved by implementing eSET, diminishing the twin birth rate without affecting the overall goal of achieving a healthy infant.