Ovarian hyperstimulation syndrome (OHSS) is an iatrogenic complication in an assisted reproduction (ART), which can threaten the life of the patient. It is caused by an increased sensitivity of ovarian receptors to exogenous gonadotrophins during controlled ovarian hyperstimulation (COH) that is necessary for induction more than one oocyte. Treatment for this syndrome is symptomatic hence the emphasis is primarily on the prevention. The purpose of current reproduction genetics is to find risk markers, by which it could be possible to assess the sensitiveness of a hormonal receptor for luteinizing hormone (LH-R) and a receptor for follicle stimulating hormone (FSH-R) just before the start of the therapy. Individualization of the COH would decrease the risk of both, the OHSS, and the risk of canceling the COH through a poor ovarian response. Temporary, only FSH-R genotypes are studied in relation to an increased risk of OHSS and its severity. The aim of further studies is an ascertaining the possible impact of LH-R´s and the luteinizing hormone´s (LH) genotype on the final ovarian response during COH and other types of hormonal treatment. This bachelor´s work summarizes the present knowledge of the possible connection of LH´s and LH-R´s polymorphisms to OHSS in continuum to findings gained about FSH-R.