Ovarian hyperstimulation syndrome (OHSS) is an iatrogenic potentially life-threatening complication of assisted reproduction techniques (ART). It is caused by an increased sensitivity of ovaries to gonadotropins administered during the controlled ovarian hyperstimulation (COH). Thus, the degree of ovarian response can be gently tuned by genetic polymorphisms of gonadotropins and their receptors. The aim of this study is to ascertain the prevalence of polymorphisms Asn291Ser (rs1470652), Ser312Asn (rs2293275) and insLQ (insertion of leucine and glutamine, rs58356637) in the luteinizing hormone chorionic gonadotropin receptor (LHCGR) gene in 102 Czech fertile men, 149 fertile women and 58 patients with serious grade of OHSS. Detection of the Asn291Ser and Ser312Asn polymorphisms was performed using TaqMan SNP Genotyping Assays. The insLQ variation was detected by the capillary electrophoresis with fluorescence-labeled primers. This study ascertained the prevalence of studied variants in Czech fertile population. Obtained results are in concordance with the majority of data from other European populations. There is no difference in prevalence between control-men and control-women. No relation to the development of OHSS was disclosed. The number of analyzed samples is too small for haplotype analysis. These data will be used for further association studies in dysfertility, hormone-dependent diseases and ovarian and testicular cancers.