The objective of this study was to examine the impact of the physicochemical properties of the loaded drug or excipient, the concentration of Kollidon®SR (KSR), and the mechanical characteristics of KSR compacts on their disintegration times. Using disintegration apparatus, a two-hour constraint was chosen as the process's end point. Lactose-KSR compacts subjected to the highest compression pressure and Microcrystalline cellulose-KSR compacts with KSR concentrations exceeding 30% exhibited disintegration times of less than ten minutes. Likewise, compacts containing Diltiazem HCl-KSR demonstrated brief disintegration times across all tested KSR concentrations and compression pressures. Compacts of Modafinil, Metformin HCl, and Ascorbic acid-KSR displayed disintegration times ranging from fast to moderate, contingent upon the levels of KSR and compression pressure applied. Compacts containing KSR with Aspirin, Salicylic acid, or Ibuprofen did not exhibit significant disintegration even at minimal amounts of KSR (0.5%). Theophylline-KSR tablets also showed prolonged dissolution times, even at very low concentrations of KSR. The disintegration times of Dic-KSR tablets were roughly close to an hour and were predominantly unaffected by varying KSR levels and only marginally influenced by compression pressures. It is possible to draw the conclusion that different drugs or excipients have different minimum KSR requirements to resist compacts' disintegration process. Compounds that demonstrate low solubility in water can result in extended disintegration times for KSR compacts. The melting points of these compounds, in conjunction with the Py values of the compacts and their compaction properties, could affect the disintegration process, although a precise evaluation is necessary.