In the context of research on topological phases of matter, quantum spin Hall (QSH) systems are especially interesting for applications in spintronics. In this work, we numerically study the dynamics of wave packets in mercury telluride (HgTe) quantum wells. This system presents topologically-protected spin polarized edge states (a signature of the QSH effect) when the width of the well is larger than a critical value ($d > d_c \sim 6.3$ nm). In our simulations, we consider the evolution of Gaussian wave-packet using the BHZ Hamiltonian through the method of (Fourier) split-operator method. We observe oscillatory behavior of the mean position of the packet, closely related to the effect of zitterbewegung. For systems which initial conditions have pseudospin pointed in z-direction (out-of-plane), and subject to an electrical field in-plane, the trajectories observed have resemblance with those in Rashba systems. On the other hand, for initial conditions where pseudospins pointed in-plane (xy-plane), we see, even without external potentials, spiral-like trajectories with no resemblance of the known zitterbewegung in Rashba systems. We also study the spin separation of the package into edge-state-like patterns at the edge of the system. The strong dependence of these behaviors with the initial conditions and the presence of electrical fields (in-plane) is also discussed.