**ABSTRACT**

Triple negative breast carcinoma (TNBC) is an aggressive form of cancer, with high rates of morbidity, mortality, poor prognosis and limited therapeutic options. The objective of the present study was to elaborate the anticancer activity of Troxerutin (TXN) in TNBC/MDA-MB-231 cells. Herein, we demonstrated the inhibitory effects of TXN on the breast cancer cell growth via induction of apoptosis. Mitochondrial membrane potential (m), DNA damage and apoptotic nuclear changes were analyzed by f lowcytometry, AO/EtBr and Hoechst staining, respectively. Furthermore, apoptotic protein and gene expressions were analyzed by western blot and reverse transcription polymerase chain reaction (RT-PCR), respectively. Our results indicated that TXN induces apoptosis as evidenced by inhibit the cell proliferation, enhanced apoptotic activation, altered mitochondrial membrane potential and elevated level of DNA damage in TNBC cells. Furthermore, the TXN inhibit anti-apoptotic protein expression with the subsequent upregulation of Cytochrome c, Caspase-9 and Caspase-3. Thus, TXN induces apoptosis in TNBC cells through inducing nuclear damage and altered apoptotic marker expressions. Therefore, TXN might be used as a potential therapeutic agent for the treatment of triple negative breast cancer.