

Tumour suppressive effects of WEE1 gene silencing in breast cancer cells.

Abstract

Background: WEE1 is a G2/M checkpoint regulator protein. Various studies have indicated that WEE1 could be a good target for cancer therapy. The main aim of this study was to assess the tumor suppressive potential of WEE1 silencing in two different breast cancer cell lines, MCF7 which carries the wild-type p53 and MDA-MB468 which contains a mutant type. **Materials and Methods:** After WEE1 knockdown with specific shRNAs downstream effects on cell viability and cell cycle progression were determined using MTT and flow cytometry analyses, respectively. Real-time PCR and Western blotting were conducted to assess the effect of WEE1 inhibition on the expression of apoptotic (p53) and anti-apoptotic (Bcl2) factors and also a growth marker (VEGF). **Results:** The results showed that WEE1 inhibition could cause a significant decrease in the viability of both MCF7 and MDA-MB-468 breast cancer cell lines by more than 50%. Interestingly, DNA content assays showed a significant increase in apoptotic cells following WEE1 silencing. WEE1 inhibition also induced upregulation of the apoptotic marker, p53, in breast cancer cells. A significant decrease in the expression of VEGF and Bcl-2 was observed following WEE1 inhibition in both cell lines. **Conclusions:** In concordance with previous studies, our data showed that WEE1 inhibition could induce G2 arrest abrogation and consequent cell death in breast cancer cells. Moreover, in this study, the observed interactions between the pro- and anti-apoptotic proteins and decrease in the angiogenesis marker expression confirm the susceptibility to apoptosis and validate the tumor suppressive effect of WEE1 inhibition in breast cancer cells. Interestingly, the levels of the sensitivity to WEE1 silencing in breast cancer cells, MCF7 and MDA-MB468, seem to be in concordance with the level of p53 expression.

Keyword: Breast cancer; G2 arrest abrogation; ShRNA; Viability inhibition; WEE1.