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Novel tubulin binding agent, noscapine: A reverse story from clinical to preclinical

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Opium alkaloid, noscapine is already working in clinics from long decades as an antitussive drug. In 1998, our group identified noscapine as a tubulin binding agent which arrests the tumor cells during mitosis. Working continuously on this molecule, we have synthesized and reported 9-bromonoscapine, 9-Chloronoscapine, 9-Iodonoscapine, 9-aminonoscapine and reduced bromonoscapine which were 5-40 fold more potent than the parent compound, noscapine. It is widely accepted fact that it does not matter how active or more potent a therapeutic molecule if it is not bioavailable at the site of action. Our preclinical pharmacokinetic analysis indicated that in therapeutic dose-dosage regimen, noscapine exhibited only 40% oral bioavailability which could not be considered optimum for clinical viability. Hence, we focused on nanoscale based drug delivery systems to scale up the noscapine nanotherapeutics. In a series of experiments, we reported the nanoencapsulation of noscapine in cyclodextrin, stealth gelatin nanoparticles, lipid nanoparticles and magnetic nanoparticles. Our studies showed the promising results and we have enhanced the noscapine bioavailability by 1.87 fold, half-life by ~10 fold and ~1.71 fold brain retention. Therefore, our compelling evidence indicated that noscapine nanotherapeuticsis are the deserving candidates for further preclinical analysis.

Effect of 15 weeks combination exercise training on IGF axis factors and some binding proteins in postmenopausal women with breast cancer: A randomized control trail

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IGF axis factors and some binding proteins can cause occurrence and recurrence of breast cancer. On the other hand, the role of combination exercise training on these factors is not clear. Thus, the aim of this study was to clarify the effect of 15 weeks combination exercise training on IGF axis factors and some binding proteins in postmenopausal women with breast cancer. Twenty nine women with breast cancer (58.27±6.31 years) who received surgery, chemotherapy and radiation therapy with current hormone therapy were divided into two groups; intervention and control. Subjects of intervention group performed 15 weeks combination exercise training including walking (2 sessions per week) and resistance training (2 sessions per week that different from walking days). Data were analyzed by using ANCOVA ($p \leq 0.05$). The findings of present study demonstrated that 15 weeks combination exercise training had significant effect on IGF-1 levels (P=0.001), IGFB-3 levels (P=0.000) and IGF-1: IGFB-3 (P=0.000) in postmenopausal women with breast cancer. After 15 weeks, IGE-1 was reduced in intervention group up 9 percent and IGFB-3 was increased by 28 percent. On the other hand, exercise training had no significant effects on the IGFB-1 (P=0.652) in postmenopausal women with breast cancer. In conclusion, because the IGF axis factors and some binding proteins plays an important role in breast cancer and its recurrence, it seems that changes of these factors by combination exercise training can delay recurrence of breast cancer.

Keywords: Combination exercise training, Breast cancer, Postmenopausal women, IGF-1, IGFBP-3, IGFBP-1.

Biography

Reza Nuri has studied cancer and exercise training for 5+ years, during which time he has authored more than 15 peer-reviewed reports in this area. He has served on the editorial boards for the *American Journal of Cancer Epidemiology and Prevention*. He is the manager of research affairs of Kish International Campus, University of Tehran.