Estrogen deficiency, characteristic of menopause, seems to alter functions associated with cognition and predispose women to neurodegenerative diseases. The cytoskeleton, consisting of microtubules, intermediate filaments (IFs) and actin filaments, is indispensable for any eukaryotic cell. Phosphorylation of IFs is known to regulate their organization and function, and these changes seem to be associated with neurodegenerative diseases. Some postmenopausal women have used hormone replacement therapy, but adverse effects of this therapy have been reported. In this sense, the use of vitamin D, considered a steroidal hormone with important role in calcium metabolism has been proposed. The aim of our study was to investigate the effect of ovariectomy on phosphorylation, immunocontent and specific phosphorylation sites of cytoskeletal proteins in the hippocampus, as well as the effect of vitamin D on possible alterations. Ovariectomy (animal model widely used to mimic the postmenopausal changes) was performed in Wistar female rats with approximately 90 days old. Thirty days after the procedure, the rats were subjected to supplementation with vitamin D (500 IU / kg body weight) by gavage for a period of thirty days. After, the animals were decapitated and the hippocampus dissected for subsequent analysis. Our results showed that ovariectomy causes hyperphosphorylation of IF of neurons and astrocytes without affecting the immunocontent of these proteins. Also, ovariectomy increases the phosphorylation status of Ser55, Ser57 and KSP repeats of neuronal IFs. Vitamin D was able to reverse the effects on phosphorylation status of IFs and specific sites of neurons IFs. In conclusion, these results together show that ovariectomy causes a dysfunction of the cytoskeleton homeostasis, which may contribute to cognitive changes in menopause woman. In addition, vitamin D appears to be promising in the reversal these effects. Supported by CNPq and CAPES.

Key Words: ovariectomy, cytoskeleton, vitamin D