INVOLVEMENT OF NF-KB AND MUSCLE SPECIFIC E3 UBIQUITIN LIGASE MURF1 IN CIGARETTE SMOKE INDUCED CATABOLISM IN C2 MYOTUBES

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Cigarette smoking has been identified as a risk factor for muscular damage and sarcopenia, the age-related loss of muscle mass and strength in old age. Cigarette smoke (CS) induced oxidative stress and p38 MAPK activation have been shown to be the main cellular mechanisms leading to skeletal muscle catabolism. In order to investigate the involvement of NF-kB as another possible cellular mechanism by which CS promotes muscle catabolism, C2 myotubes, from an *in vitro* skeletal muscle cell line, were exposed to different time periods of whole vapor phase CS in the presence or absence of NF-kB inhibitor, IMD-0354. The CS-induced reduction in diameter of myotubes and time-dependent degradation of the main contractile protein myosin heavy chain were abolished by NF-kB inhibition. Also, C2 exposure to CS resulted in IkB-α degradation and NF-kB activation, which led to up-regulation of the muscle specific E3 ubiquitin ligase MuRF1 but not MAFbx/atrogin-1. In conclusion, our results demonstrate that vapor phase CS exposure to skeletal myotubes triggers NF-kB activation leading to skeletal muscle cell damage and breakdown of muscle proteins mediated by muscle specific E3 ubiquitin ligase MuRF1. Our findings provide another possible molecular mechanism for the catabolic effects of CS in skeletal muscle.