Is heavy physical exercise a risk factor for ALS? Pro

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Historical epidemiological evidence suggested an association between physical activity (PA) and risk of ALS: well known sportsmen such as Lou Gerhig (baseball), Ezzard Charles (boxing), Don Revie (football) and Jarrod Cunningham (rugby) have developed MND. Soccer and American football players are a population at risk: 7 fold increase in risk to develop MND reported by Chio et al (2005) and 40 fold increase reported by US study (2007). Epidemiology studies found association between MND and varsity athletics (Scarmeas et al, 2002) as well as occupational or leisure exertion (Strickland, 1996). An epidemiological study, investigating lifetime physical activity as a risk factor for MND provided supporting evidence (Veldink, Kalmijn et al, 2005). Amateur soccer players are also at risk (Wicks et al, 2007). Methodological limitations may have restricted conclusions. More recent evidence is supported by a robust study published by Harwood et al (2016) which demonstrated by using a valid physical activity questionnaire a positive association between MND and PA. The strongest associations were for adulthood vigorous PA per extra hour/day (OR 1.19 (95%CI 1.06-1.34) and adulthood casual exercise per 10KJ/kg/day (OR 1.47 (95%CI 1.1-1.97). A large historical cohort study (Fang et al, 2016) including 212,250 Vasaloppet participants from 1989-2010 demonstrated that fastest skiers participating over 4 times had 12-fold increase risk for ALS as compared to 508,176 randomly matched control from the Swedish population register. Among 161,809 postmenopausal women, Eaglehouse (2016) showed an association with a 1,56 OR ALS for strenuous PA 3 times per week as compared to no reported strenuous PA. PA augments pathophysiological mechanisms known to contribute to MND, in particular hyperexcitability and oxidative stress. Moreover sports professions with the increased risk of MND also have increased risk of chronic traumatic encephalopathy which is a TDP-43 proteinopathy as MND and FTD.