

European Respiratory Society Annual Congress 2012

Abstract Number: 91

Publication Number: P4353

Abstract Group: 6.2. Occupational and Environmental Health

Keyword 1: Lung function testing **Keyword 2:** Occupation **Keyword 3:** Smoking

Title: Quartz exposure and lung function

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Body: Occupational exposure to quartz not only leads to silicosis but also to chronic bronchitis and obstructive lung disease. In Austria more stringent occupational limit values for dusts have been introduced in 2007. We assumed that (a) workers exposed to mineral dusts (quartz) have a poorer lung function (LF) than other workers that undergo repeated LF testing because of other occupational exposures (dusts and fumes), (b) LF decline is fastest in the quartz-group, and (c) the decline slowed down after the introduction of stricter limit values. We examined repeated LF data (FVC, FEV1, MEF50) from the routine examination (usually every two years) performed by one occupational health centre from the years 2002 through 2010. Three main linear regression models were analysed on each LF parameter. (a) The effect of quartz exposure on the raw parameter after controlling for age, height, weight (quadratic term), gender, and smoking. (b) The effect of quartz exposure on the difference between actual value and the age-sex-height-dependent Austrian norm value. This approach allowed us to additionally control for the impact of duration of exposure. (c) The impact of quartz exposure on the intra-individual decline in LF parameters per year. In this analysis we could also check for differences in the slope before and after the introduction of new limit values. We analysed 7315 data-sets (on average 5 per person, mostly males). Nearly 40% of these were from workers exposed to quartz dusts. The remaining workers were welders or were exposed aluminium or other dusts. Both smoking and quartz exposure lead to lower LF values. Duration of quartz exposure also was a significant predictor of LF decline. The decline slowed after the introduction of stricter limit values.