

10-15 years old children living in Malta are at higher risk for developing allergic respiratory diseases than those living in Southern Sicily

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Abstract

Aim of the study was to evaluate the influence of living in highly polluted areas in Malta and in Sicily on reported allergic respiratory diseases in children. Malta has a very high population density while the petrochemical industry located close to Gela is one of the main sources of industrial air pollution in Sicily. In the context of RESPIRA Project, we evaluated 2,047 schoolchildren (972 M), aged 10-15 yrs, selected from 12 junior high schools of Southern Sicily (n=1,189 evaluated subjects) and 6 of Malta (n=858). Children's parents fulfilled an ISAAC respiratory questionnaire. Rhinitis in the last 12 months was reported by 23.5% in Italy and 27.3% in Malta (p=0.05); wheeze in the last 12 months (W12m) by 7.4% in Italy and 12.7% in Malta (p<0.0001); doctor diagnosed asthma (DDA) by 7.9% in Italy and 18.1% in Malta (p<0.0001). Current asthma (CA), defined as DDA + W12m, was reported by 3.0% in Italy and 7.8% in Malta (p<0.0001). Use of drugs for asthma in the last 12 months was reported by 4.9% in Italy and 12.1% in Malta (p<0.0001). In a logistic model, when correcting for asthmatic bronchitis in the first two years of life, parental atopy, early and current passive smoke exposure, mould/dampness at home, personal history for rhinitis, socioeconomic status and presence of pets at home, children living in Malta showed a higher risk factor for CA with respect to those living in Southern Sicily (OR 2.48, CI 1.32-4.70, p<0.005). In conclusion, children living in Malta are at higher risk for developing allergic respiratory diseases with respect to those living in Southern Sicily

Introduction

Asthma is due to an interaction between genetic background and environmental conditions and its prevalence has become increasing especially in industrialized countries. Environmental and host risk factors may play a different role on allergic asthma: air pollution may aggravate symptoms in symptomatic patients and induce symptoms in asymptomatic patients. Children are more susceptible to both the acute and chronic adverse effects of ambient air pollution. Aim of the study was to assess the possible role of living in different polluted areas on current asthma prevalence in schoolchildren.

Methods

Between March 2012 and February 2013 in the context of RESPIRA project, a Cross-Border Cooperative Programme Italy-Malta 2007-2013, an epidemiological survey was performed on 2,047 schoolchildren, aged 10-15 years, selected from 12 junior high schools of the Health District of Caltanissetta in the Mediterranean area of Southern Italy (Sicily) (n=1,189 evaluated subjects) and 6 of Malta (n=858) (Figure 1). Parents of all children fulfilled a respiratory questionnaire regarding children past and current respiratory allergic symptoms, smoking habits and other personal information such as environmental and home exposures. The schoolchildren were investigated through respiratory standardized questionnaires.

Results

Rhinitis in the last 12 months (R12m) was reported by 23.5% in Italy and 27.3% in Malta (p=0.05); wheeze in the last 12 months (W12m) by 7.4% in Italy and 12.7% in Malta (p<0.0001); doctor diagnosed asthma (DDA) by 7.9% in Italy and 18.1% in Malta (p<0.0001). Current asthma (CA, defined as DDA + W12m), was reported by 3.0% in Italy and 7.8% in Malta (p<0.0001). Use of drugs for asthma in the last 12 months (D12m) was reported by 4.9% in Italy and 12.1% in Malta (p<0.0001). In a logistic model, when correcting for asthmatic bronchitis in the first two years of life, parental atopy, early and current passive smoke exposure, mould/dampness at home, personal history for rhinitis, socioeconomic status (SES) and presence of pets at home, children living in Malta showed a higher risk factor for CA with respect to those living in Southern Sicily (OR 2.37, CI 1.26-4.45, p=0.007) (Table. 1)



Figure 1 – Geographical localization of the investigated area

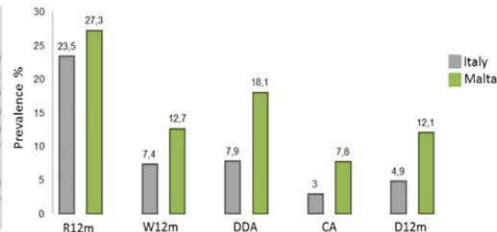


Figure 2 – Prevalence of Rhinitis in the last 12 months (R12m, p=0.05); wheeze in the last 12 months (W12m, p<0.0001); doctor diagnosed asthma (DDA, p<0.0001). Current asthma (CA, p<0.0001). Use of drugs for asthma in the last 12 months (D12m, p<0.0001) in Italy and Malta.

Table 1 - Multiple logistic regression analysis for current asthma with relevant odds ratios (OR) and 95% confidence intervals

	OR	95% Lower	95% Upper	p Value
Gender (Ref. F)	0.61	0.36	1.01	0.59
Early ETS	1.45	0.78	2.70	0.23
Asthmatic bronchitis 2yrs	7.41	4.25	12.90	< 0.0001
Parental atopy	1.86	1.12	3.11	0.017
Current ETS	1.04	0.55	1.99	0.89
Mould/dampness	1.12	0.60	2.08	0.72
SES	1.54	0.64	3.69	0.92
Rhinitis	4.17	2.48	7.01	< 0.0001
Presence of Pets	1.07	0.63	1.84	0.79
Malta (Ref. Italy)	2.37	1.26	4.45	0.007

Conclusions

The prevalence of investigated respiratory diseases was higher in Malta with respect to Sicily. In particular, when corrected for confounding factors, the risk for CA in Malta was more than twofold with respect to Sicily.