RECREATIONAL SWIMMING IS ASSOCIATED WITH DECREASE OF FEV1/FVC RATIO BUT NOT WITH SMALL AIRWAY OBSTRUCTION OR BRONCHIAL HYPERRESPONSIVENESS

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AIM: Although pools are attended by millions of people worldwide, few epidemiological studies have so far been carried out to ascertain the effect of recreational swimming on respiratory function. The aim of the study was to evaluate lung volumes and bronchial responsiveness to methacholine in attenders of swimming pools.

METHODS: The present study is based on a cross-sectional survey of a sample of recreational swimmers stratified by age (18-55 years), recruited from attenders to four pools of the city of Verona. Individuals agreeing to take part, were required to perform forced expiratory manoeuvres in to a portable spirometer. Measurements included forced vital capacity (FVC), forced expiratory volume in one second (FEV1) and forced expiratory flows between 25 and 75% of FVC. Results were expressed as percentage of predicted values. A randomly selected subgroup of 500 subjects, underwent methacholine challenge, expressing the results as PD20, considering responders the subjects with a PD20 value < 2000 mcg. Data on age, sex, smoking habits, respiratory symptoms, diseases were collected by mean of a standardized questionnaire modified from the short form of the European Community Respiratory Health Survey (ECRHS) questionnaire.

RESULTS: 1144 subjects agreed to take part in the study. They were divided into four groups on the basis of time spent in swimming pool during life (group1 < 80 hours/life; group2 80-320 hours/life; group 3 320-1080 hours/life; group 4 > 1080 hours/life). FVC% predicted (group1 100.7±10.7%, group2 100.6±12.8%, group3 101.9±12.2%, group4 105.7±13.3%) and FEV1% predicted (group1 100.6±11.3%, group2 99.7±13.0%, group3 100.5±12.5%, group4 103.0±11.9%) were positively related to pool attendance (r= 0.17, p<0.0001; r=0.11, p<0.0001, respectively). FEV1/FVC% predicted (group1 104.6±7.4%, group2 104.1±8.6%, group3 103.8±7.81%, group4 102.9±7.9%) resulted negatively related to the hours spent in swimming pool (r=0.079 p< 0,05). On the contrary, no relationship was found between FEF25-75% predicted, bronchial responsiveness to methacholine (expressed as the percentage of positive subjects/quartile) and swimming pool attendance.

CONCLUSIONS: 1) recreational swimming is associated with a significant increase in vital capacity along with a smaller increase in FEV1; 2) as a result of the relative different effect of swimming on FVC and FEV1, pool attendance is associated with a decrease of FEV1/FVC without evidence of small airway obstruction or increase in bronchial responsiveness.