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The second generation and asthma: Prevalence of asthma among Israeli born children of Ethiopian origin

Michal Shani [a,b,*], Yael Band [c,f], Mona Iancovici Kidon [d,f], Michael J. Segel [c,e,f], Reena Rosenberg [a,b,f], Sasson Nakar [a,b,f], Shlomo Vinker [a,b,f]

[a] Department of Family Medicine Central District, Clalit Health Service, Israel
[b] Department of Family Medicine, Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
[c] Sackler Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel
[d] The Children's Health Centre, Paediatric Allergy, Rishon Lezion, Israel
[e] Institute of Pulmonology, Sheba Medical Center, Tel Hashomer, Ramat Gan, Israel

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Summary
Background: Immigrant populations moving from undeveloped countries with low asthma prevalence have shown increased asthma prevalence in their new Westernized environment. We compared the prevalence of asthma among Israeli born children of Ethiopian origin to that in non-Ethiopian children.
Methods: Cross sectional study. Data was retrieved for children aged 6–18 years in four clinics with a large proportion of patients of Ethiopian origin. For each Israeli born child from Ethiopian origin we matched an Israeli born child of any other origin of the same age and gender, receiving primary care from the same physician at the same clinic. Asthma was defined as any visit to a primary care physician, emergency room or hospitalization related to asthma symptoms or subsequent purchasing of any asthma medication during 2008.
Results: 1217 children of Ethiopian origin and 1217 matched controls were studied. More Ethiopian children came from families with a low socioeconomic status (23.9% vs. 17%, $p < 0.001$), and with significantly lower parental smoking (5.1% vs. 40.1%, $p < 0.001$).

The prevalence of asthma was 92/1217 (7.5%) among children of Ethiopian origin, compared to 122/1217 (10.0%) among the control group (OR = 0.74, 95% CI: 0.56–0.98, $p = 0.032$). When adjusted for tobacco exposure, the OR for risk of asthma in the Ethiopian children was 0.80 (95% CI: 0.59–1.09, $p = 0.16$).

* Corresponding author. Family Medicine Department Central District, C/O Hadas, 56 Chen St., Rehovot 76469, Israel. Tel.: +972 8 9466394; fax: +972 8 9364007.
E-mail address: michal.shani@gmail.com (M. Shani).
[f] Family Medicine Department Central District, C/O Hadas, 56 Chen St., Rehovot 76469, Israel.

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Conclusion: Asthma prevalence in the second generation of Israeli born children of Ethiopian origin does not seem to differ from other children in their community. This observation supports the theory that environmental exposures, rather than genetic factors, dictated the increase in asthma in this immigrant population.

Background

Asthma and allergy are the epidemic of the past century, with increased rates documented worldwide.[1] Immigrant populations traditionally moving from rural undeveloped countries with relatively low disease prevalence have consistently shown an increased prevalence of asthma in their new, usually Westernized, environment.[2–5]

Ethiopian immigrants arrived in Israel in two main waves, during the 1980s and during the early 1990s. In addition, immigration from Ethiopia to Israel continued in small numbers throughout the years. There are over 100,000 people of Ethiopian origin in Israel today. Asthma prevalence among Ethiopian immigrants upon arrival was 2.5%.[6] The reported prevalence at that time was 3.7% in the general Israeli population.[7]

A study performed in Israel during the 1990s found a threefold higher rate of asthma in adults among Ethiopian immigrants when compared to the general population — 17% vs. 5.8%,[8] and noticed a trend toward increasing frequency of asthma with increased time from immigration. Asthma prevalence was 14.4% in immigrants six years after arrival in Israel vs. 20% in immigrants 13 years after immigration.

Another study from Israel showed that in children of Ethiopian origin, total IgE levels were high upon arrival but gradually decreased over the years after immigration. In healthy Israeli born children of Ethiopian origin, total IgE levels were similar to age matched Israeli born controls; however, Israeli born children of Ethiopian origin with clinical evidence of respiratory atopic disease (asthma and/or allergic rhinitis) had significantly higher levels of total IgE than non-Ethiopian age matched asthmatics. These observations on the whole, may implicate both genetic and environmental causes.[9]

Several other studies worldwide have shown a higher rate of asthma in immigrant populations when compared to the local population.[4,5] However, as far as we know, no data has been published concerning the prevalence of asthma in the second generation, the children of immigrating parents, in Israel or any other Western immigrant society.

This present study aimed to compare the prevalence of asthma among Israeli born children of Ethiopian origin to the disease prevalence in non-Ethiopian children living in the same neighborhood.

Methods

The study was conducted in the Central District of "Clalit Health Service" (CHS) in Israel, and was approved by the Meir Health Center ethics committee (Approval Number 103/2010).

Israel has a national health system with universal access to medical care. CHS is the largest health maintenance organization (HMO) in Israel. It serves more than 50% of Israel's population and about 70% of the Ethiopian immigrant population. Patients' files in CHS have been completely computerized for more than a decade. Patients' information includes demographic data which is directly updated from the population registry of the Interior Ministry and includes ID number, parents' names and ID numbers, date and place of birth, parents' place of birth and parents' income bracket. Patients are defined as low socioeconomic status (SES) by the National Insurance Institute of Israel according to patients' income. We defined children as low SES if at least one of their parents were considered as being in a low SES.

The design of the study is a cross sectional.

Patients

Data was retrieved in 4 urban clinics with a high percentage of patients of Ethiopian origin, serving a total population of over 25,000 patients of all ages. Each clinic serves its local population.

All Israeli born children of Ethiopian origin (both parents Ethiopian born) age 6—18 years were included in the study. Children <6 years old were not included in order to exclude non-asthmatic phenotypes of early childhood wheezing. For each Israeli born child of Ethiopian origin we matched an Israeli born child of any other origin (neither parent of Ethiopian origin) that was, of the same age and gender, receiving primary care from the same physician at the same local clinic. (Controls were chosen randomly if there was more than one match). We retrieved information about SES, number of siblings, chronic diagnoses, hospitalizations, emergency room visits and parents' smoking status.

We used a case definition of asthma as any visit to a primary care physician, emergency room (ER) or hospitalization related to asthma symptoms. Specifically, any visit related to asthma symptoms such as dyspnea, chest tightness, cough, nocturnal or exercise induce cough, that was summarized by the primary care physician as asthma/wheezing/bronchitis, or that led to the prescription of any asthma medication, or to the subsequent purchase of asthma medication (bronchodilators: terbutaline or salbutamol, inhaled steroids: budesonide or fluticasone, combined inhalers or montelukast), from January 1st to December 31st 2008, was considered to indicate asthma.

All community pharmacies used by CHS are computerized and report to one central repository. We documented all prescriptions of asthma medications that were filled by the patients during 2008. CHS issues asthma medications and