

Overweight, obesity and hypertension among adolescents - the impact of immigration and acculturation

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Background and Aims:

The migration from one cultural milieu to another has drastically increased cardiovascular risk factors and disease rates.

We studied the prevalence of overweight and obesity, and hypertension among adolescents of Ethiopian origin who immigrated to Israel, as well as on Israeli born children of Ethiopian origin.

Methods:

Adolescents aged 16-19 years, who were medically examined prior to mandatory military service in Israel between 1992 through 2016 were included. Of 39,640 examinees of Ethiopian origin (24,199 males and 15,441 females), 15,793 were Israeli-born and 23,487 were immigrants. As controls served 277,789 adolescents (171,945 males and 105,844 females) from families that were at least 3 generations in Israel. BMI was stratified by sex and divided to 6 groups: <17, 17.5-18.4, 18.5-19.9, 20.0-22.4, 22.5-24.9, >25.0 kg/m². Hypertensive-range blood pressure values adjusted for age, sex and height served as the outcome.

Results:

Prevalences of overweight/obesity directly correlates with the time lapse since immigration among Ethiopian Israelis

	males	females
Immigrated between age 12-20 years	1.1%	5.9%
Immigrated between age 6-12 years	2.4%	5.2%
Immigrated between age 0 to 6 years	5.7%	8.7%
Israeli born Ethiopians -	13.8%	15.6%
Native Israelis	19.9%	17.2%

Prevalences of hypertensive-range blood pressure directly correlates with the time lapse since immigration among Ethiopian Israelis

	males	females
Immigrated between age 12-20 years	7.3%	11.5%
Immigrated between age 6-12 years	10.6%	16.7%
Immigrated between age 0 to 6 years	14.4%	19.3%
Israeli born Ethiopians -	23.2%	23.7%
Native Israelis	20.0%	20.8%

During 1992-2016, prevalences of overweight/obesity increased disproportionately among Israeli born adolescents of Ethiopian origin compared to native Israelis.

- Among males and females of Ethiopian origin born in Israel, the prevalence of overweight/ obesity increased by 2.5- and 4-fold, respectively, compared to a 1.5-fold increase among native Israelis of both sexes during the last two decades (Figure 1).
- Notably, the prevalence of overweight/obesity among females of Ethiopian origin who were born in Israel has surpassed the prevalence of their native Israeli counterparts.

Obesity & overweight prevalence in the years 1999-2016

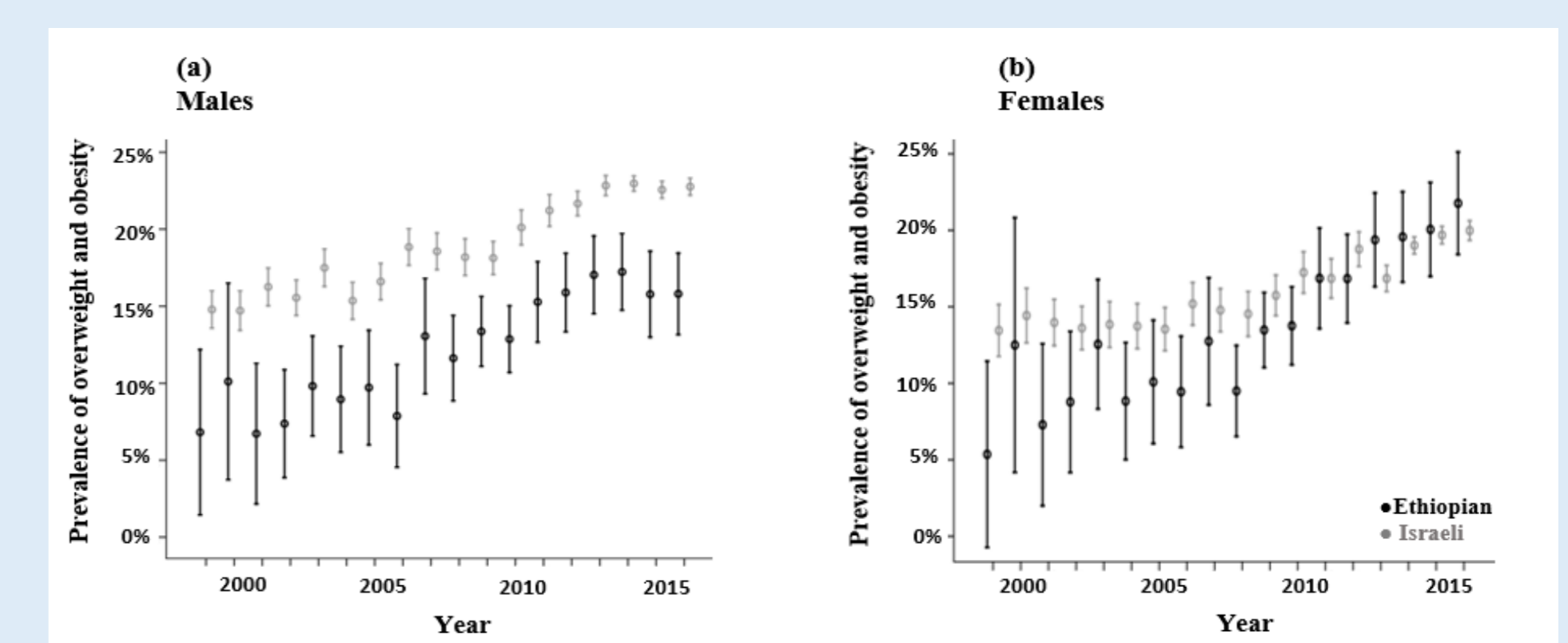


Figure 1: The annual prevalence rates ($\pm 95\%CI$) of overweight and obesity for native Israelis and Ethiopian born Israelis are shown in figures a (males) and b (females).

Hypertension according to BMI groups

- Mean systolic and diastolic blood pressure values were higher for both males and females of Ethiopian origin born in Israel than for native Israelis, for all 6 BMI groups considered (Figures 2a-d).

The association between BMI and blood pressure by Israeli and Ethiopian origin

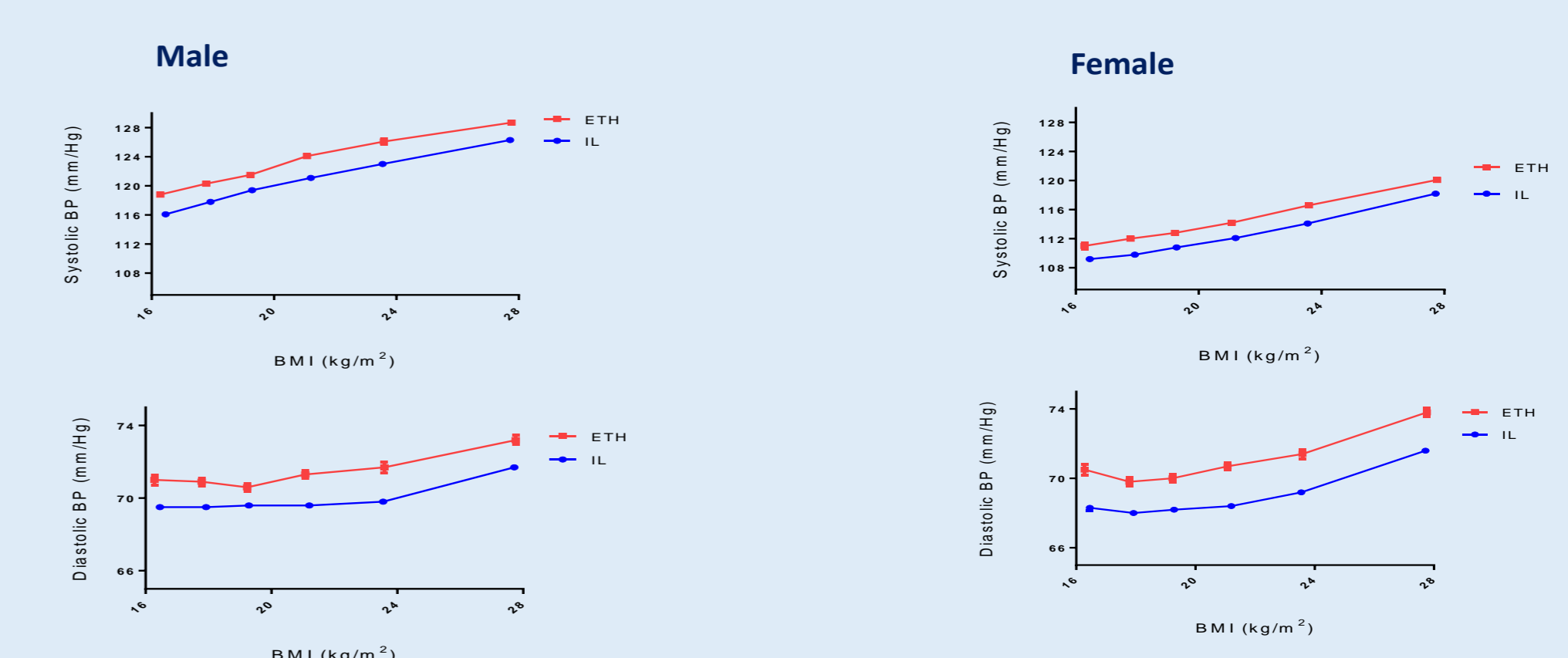


Figure 2: Mean systolic blood pressure among males and females, and diastolic blood pressure among Israeli born Ethiopians and native Israelis, according to BMI.

Israeli-born Ethiopians had a significantly higher risk for hypertensive range measurements at any BMI level compared with native Israeli born examinees, after adjusting for sociodemographic factors and health status. (Figure 3).

Odds ratio for hypertensive-range blood pressure according to BMI groups

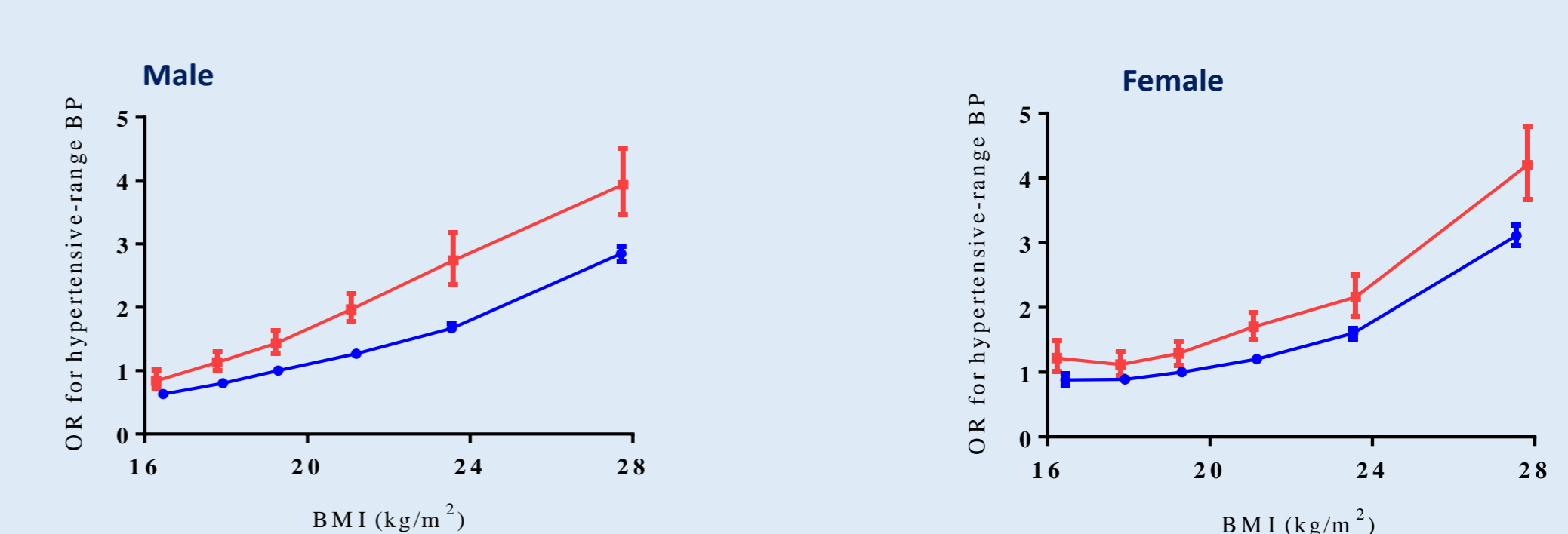


Figure 3: Odds ratio for hypertensive-range blood pressure according to BMI groups. The reference group is native Israelis with BMI 18.5-19.9 kg/m².

Conclusions:

- Among Ethiopian Israeli adolescents, abnormal blood pressure correlates directly with the time lapse since immigration.
- Increased blood pressure was found with increasing BMI among Israelis of Ethiopian origin than among native Israelis.
- The increase in BMI over the study period was most pronounced for Ethiopian females.
- **In light of the waves of immigration that have occurred over recent years from developing to developed countries, immigrant populations require targeted surveillance and appropriate intervention**