Table 1 Basic characteristics of study population according the Chinese famine[†]

	All subjects ($n = 10\,935$)	Male ($n = 6293$)	Female ($n = 4642$)	Statistical values	P*
Age (years)	49.93 ± 2.97	49.89 ± 2.98	49.98 ± 2.95	1.49	0.1351
Height(cm)	163.10 ± 7.92	167.80 ± 5.96	156.80 ± 5.50	98.34	<0.0001
Weight(kg)	64.50 ± 10.70	69.78 ± 9.54	57.33 ± 7.54	73.58	<0.0001
Gamma-glutamyl transferase (U/L)	26.00(29.00)	34.00(37.00)	17.00(14.00)	48.77	<0.0001
Alanine aminotransferase (U/L)	21.00(16.00)	25.00(17.00)	17.00(11.00)	36.16	<0.0001
Aspartate aminotransferase (U/L)	22.00(8.00)	23.00(9.00)	20.00(7.00)	20.35	<0.0001
Body mass index (BMI, kg/m^2)	24.15 ± 2.94	24.76 ± 2.87	23.32 ± 2.81	26.18	<0.0001
Obesity (%)[‡]	1098(10.04)	808(12.84)	290(6.25)	128.45	<0.0001
Systolic blood pressure (mmHg)	125.11 ± 18.39	127.80 ± 18.20	121.50 ± 18.03	17.97	<0.0001
Diastolic blood pressure (mmHg)	79.17 ± 12.83	82.35 ± 12.74	74.85 ± 11.65	31.53	<0.0001
Hypertension (%)[§]	2719(24.87)	1936(30.76)	783(16.87)	275.94	<0.0001
Fasting plasma glucose (FPG, mmol/L)	5.50 ± 1.29	5.67 ± 1.48	5.28 ± 0.93	15.72	<0.0001
Hyperglycemia (%)	1567(14.33)	1194(18.97)	373(8.04)	260.21	<0.0001
Fatty liver disease (%)	3815(34.89)	2858(45.42)	957(20.62)	722.87	<0.0001

* P values were calculated by the means of Student t-test, Wilcoxon rank sum test, or chi-square test.

[†]Data are presented as mean ± standard deviation, median (interquantile range), or number (percentage).

[‡]Obesity was defined as BMI ≥ 28.

[§]Hypertension was defined as SBP ≥ 140 mmHg and/or DBP ≥ 90 mmHg in at least two measurements, or a previous diagnosis of hypertension by a clinician or self-reported current use of anti-hypertensive medication.

[¶]Hyperglycemia was defined as FPG ≥ 6.1 mmol/L.

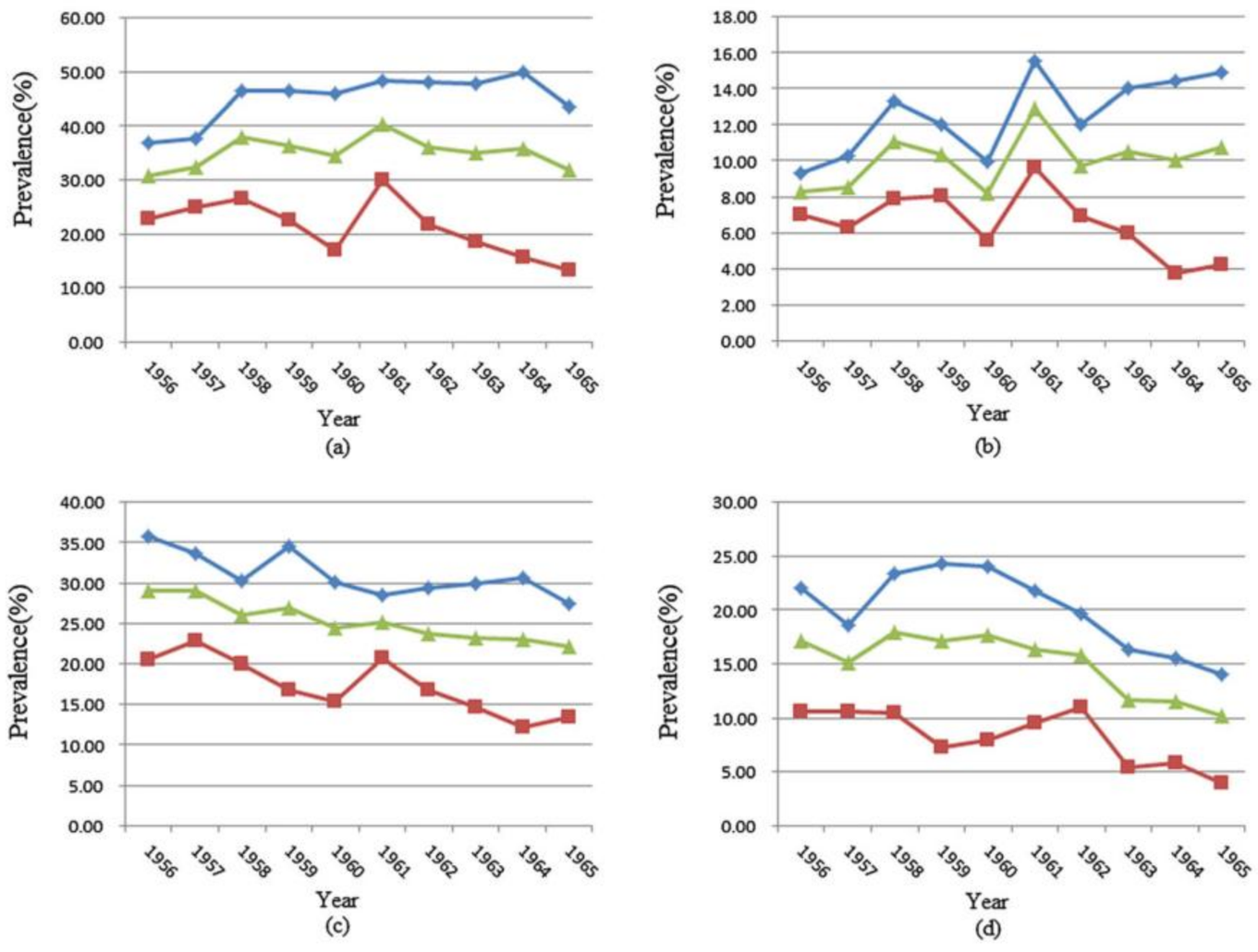

Figure 1 Gender-specific prevalence of (a) fatty liver disease, (b) obesity, (c) hypertension, and (d) hyperglycemia among subjects according to the birth years (1956–1965) in Chongqing, China, —◆—, male; —■—, female; —▲—, total.

subjects. Compared with the subjects born in the non-exposed group, the odds ratio for obesity of the subjects born in 1961 was increased by 38.4% (95% CI: 1.101–1.738) after adjustment of age and sex. The odds ratios of being hyperglycemia are significantly higher in the subjects born in 1960 (1.293 times, 95% CI: 1.041–1.605), 1961 (1.321 times, 95% CI: 1.073–1.626), and 1962 (1.362 times, 95% CI: 1.156–1.604) than the non-exposed group. No positive association was observed in effects of Chinese famine on hypertension among total study population.

Discussion

Although there is strong evidence from animal models that maternal nutritional status during pregnancy can induce permanent changes in the fetus, it is still not clear how this might apply to human populations. Our study adds to the literature on the effects of famine exposure in developing countries. In the present ecological study, we have found that exposure to the Chinese famine during fetal life and infancy was associated with a marginally higher risk