Risk factors for type 2 diabetes mellitus in secondary school students in Port Harcourt, Nigeria

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Background

There is evidence to suggest an increase in type 2 diabetes mellitus worldwide even in children and adolescents. It is usually preceded by a period known as prediabetes and other risk factors such as elevated blood pressure, obesity, hypertriglyceridemia and family history of diabetes mellitus. Following the International society for Paediatric and adolescent diabetes criteria, we sought to find out how many adolescents were at risk of type 2 diabetes mellitus.

Objectives

To determine the number of subjects who had selected risk factors for type 2 diabetes mellitus.

Methods

A cross sectional study was carried out in 6 public secondary schools in Port Harcourt metropolis after multistaged sampling. Adolescents whose parents gave informed written consents had their bio data, and risk factors for diabetes collected. Blood pressure was measured using mercury sphygmomanometer early in the morning, FBG was measured using well calibrated and standardised Acu-check active glucometer. Weight and height were measured using standard techniques and then BMI was calculated. subjects with FBS >5.5mmol/L had an OGTT done. Data collected were analysed using medcal 3000® to determine BMI and BP percentile, and SPSS 20 to calculate measures of central tendencies of FBS, BP, BMI. Students t-test was used to compare mean values of variables, and p values <0.05 were considered significant

Results

Eight hundred and eighty subjects were screened during the study period for four risk factors. The mean FBS was 5.18 mmol/L (range 1.9 – 7.3).

One hundred and fifty three (17.4%) subjects had FBS >5.5mmol/L. A total of 219 (24.9%) had elevated BP(systolic and/ or diastolic) out of which systolic BP was elevated in 130 (14.8%) subject, while 135 (15.3%) had elevated diastolic BP.

The male population weighed more and were taller than the females but the females had higher mean BMI than the males. There was no significant difference in the mean FBG between males and female, p = 0.709.

One hundred and twenty four subjects (14.1%) had BMI > 85th percentile of which 25 (2.8%) were obese, and 101 (11.5%) were overweight.

Only one female had all four risk factors while twenty four (2.7%) subjects had 3 risk factors for type 2 DM. A total of 60 subjects had OGTT out of which 10(6%) had impaired glucose tolerance. Of the 24 subjects with 3 risk factors, 2 (8.3%) females were in early adolescence, 12 (50%) (2 males, 10 females in mid adolescence, 10 (41.7%) (5 males and females each) in late adolescence.

Table 1: Clinical parameters of subjects

Parameters	male (303)	female (577)	t test	p value
Weight (kg)	50.90 ± 10.49	48.61 ± 9.14	3.201	0.001
Height (cm)	156.16 ± 10.20	150.08 ± 7.24	9.21	0.001
BMI (kg/m²)	20.67 ± 2.72	21.50 ± 3.37	-3.96	0.001
Systolic BP (mmHg)	112.25 ±13.20	109.56 ± 11.23	3.011	0.003
Diastolic BP(mmHg)	65.9 ± 10.06	66.97 ± 8.81	-1.559	0.119
FBG (mmol/L)	5.17 ± 0.47	5.18 ± 0.48	-0.373	0.709

Fig 1. Risk factors of subjects

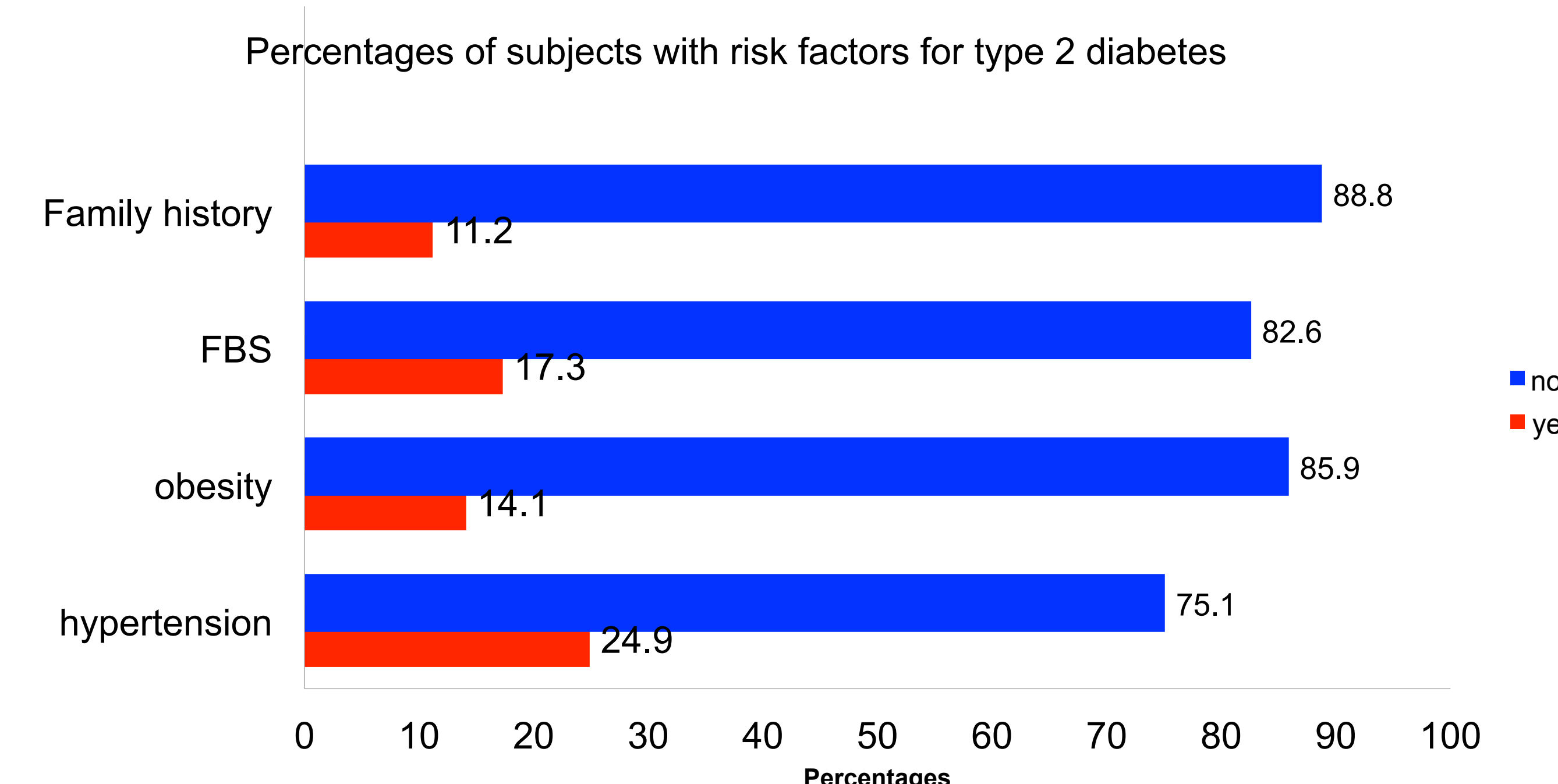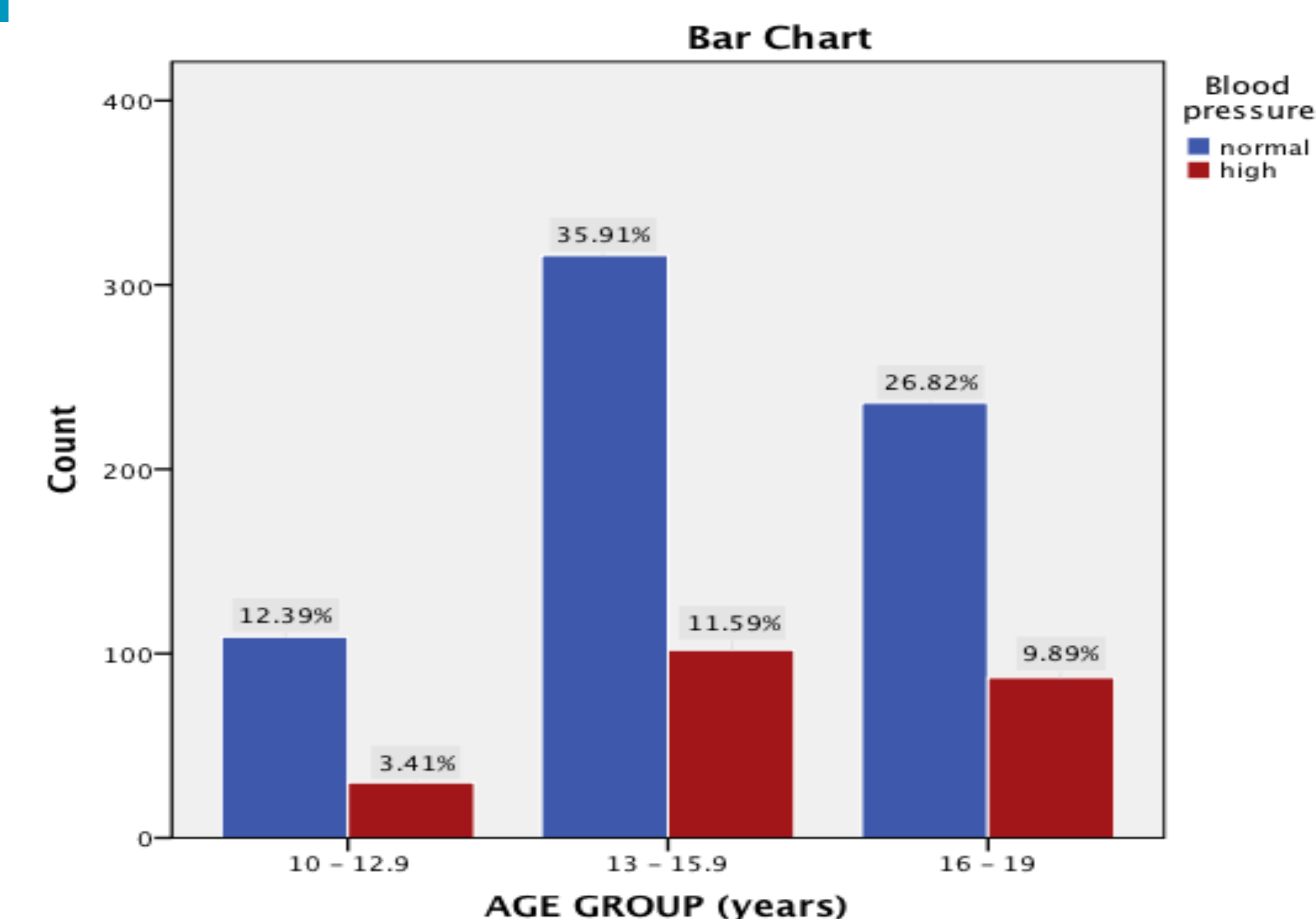Percentages of subjects with risk factors for type 2 diabetes

Fig 2: Age distribution of subjects with hypertension

Discussion

ADA criteria for suspecting type 2 diabetes include family history of diabetes in 1st or 2nd degree relation, impaired glucose tolerance, overweight and /or obesity, hypertension and signs of insulin resistance. We found a high percentage of subjects with at least one of these risks factors. With 24.9% hypertension rate, there is no doubt the risk for cardiovascular pathologies is increasing in an unsuspecting population. Females are more at risk for obesity as previously reported in other studies and they had more impaired blood glucose tolerance even at adolescence.

Conclusion

The population studied showed a large percentage with risk factors for type 2 diabetes, and it is proposed that urgent and efficient measure are taken to reduce the prevalence of this preventable disease and also the long term effect it has on young children.

References

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