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Study on the incidence of obese hypertensive patients among Malaysians of Indian ethnicity in Kedah and discussion on Role Bariatric Surgery

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Abstract
A study was conducted among the Malaysian of Indian ethnicity population on the incidence of hypertension among the obese people. In this study 219 took part and among them 124 are male and 95 are females. Of them 142 (57%) are either overweight (27%) or obese (30%). Of the 61 male hypertensives 22 (17.7%) were normal BMI, 39 (63.9 %) were Overweight or obese (11 +28).18%+ 9% = 27%, 42 males have 120/80 to 140/90 BP, Overweight or obese 13 (30.9%) are overweight and 13 were obese. Out of 21 normotensives 6 were obese and 2 were overweight. Among the sexes normal BMI males (43.15%) had hypertension and females 6 (23%), overweight males 28 (65.1%) and in overweight Females 12 (30%) and in obese males 11 (36.6%) and females (48.27%). In case of Stage 1 hypertension, normal BMI had 22 (28.27%), overweight 27 (32.5%) of them males 11(25.58%), females 14 (35%) and obese males 13 (43.3%) and females 9 (31%).The incidence of hypertension among overweight and obese people is more when compared to normal people. The incidence is more in the female population. Lifestyle modifications and medical treatment for obesity may not be helpful in the long term. To take many figts for the hypertension and their side effects make the treatment difficult for the patient. Bariatric/metabolic surgery is an alternate treatment to reduce obesity, thereby controlling hypertension.

Keywords: Malaysian Indians, obesity, hypertension, bariatric surgery

Introduction
In the modern world the incidence of the obesity and hypertension are increasing enormously.

Among the Asian countries the incidence of obesity is highest in Malaysia. Approximately half of the population are overweight or obese. In two decades, the prevalence of overweight and obesity had increased by three times. Now about 12% of the children are obese. (NHMS 2015).Obesity produce hypertension, coronary arterial disease and diabetes. Obesity can affect routine life by producing breathlessness, snoring, sleep apnoea, difficulty with physical activity and arthritis. It can produce depression. The prevalence of high blood pressure (known and undiagnosed) among adults (18 years and above) in 2015 was 30.3%.The long-term results for lifestyle modifications and medical treatment for obesity are not helpful. To take many figts and their side effects make the treatment difficult for the patient. Bariatric/metabolic surgery is a very effective treatment to reduce obesity, thereby controlling hypertension. Study was conducted to find the incidence of hypertension among the obese people of Indian ethnicity in Kedah, Malaysia and inform them the benefits of Bariatric surgery. In this article the current evidence on the impact of bariatric/metabolic surgery on blood pressure control and its future area of research is discussed.

2.1. Material and methods
A Heath camp was conducted during a religious festival at Kedah, Malaysia, where a survey was done to find out the incidence of hypertension among Malaysians of the Indian ethnicity.

Inclusion criteria
All Indians. Age group. All above 16 years. Sex: both males and females/ Exclusion. Other ethnicity people. Age: Below 16 years Data's collected. For all the people height and weight and blood pressure ws measured and BMI was calculated. 213 people took part in this survey, of them 124 were males and 95 were females.

2.2. The body mass index (BMI): Is generally used to classify an adult population as underweight (BMI <=18.5), overweight (BMI >=25.0) or obese (BMI >=30.0). The normal BMI range lies between 18.5 and 24.99. The BMI is calculated by a person's weight in kilograms divided by the square of his or her height in metre (kg/m2).

2.3. Blood pressure categories: Normal: Less than 120/80 mm Hg; Elevated: Systolic between 120-129 and diastolic less than 80; Stage 1: Systolic between 130-139 or diastolic between 80-89; Stage 2: Systolic more than 140 or diastolic more than 90 mm Hg;

3. Results
Total number of persons in this study was 219 and 124 are male and 95 are females.

3.1 Males: Obesity: 24.2%
Hypertension: 17.7%
Stage 1: 10.5%
Obesity + hypertension: 8.9%
Obesity+ Stage I hypertension: 29%
3.2. Age: <40: obesity + hypertension = 1%, Obesity+ stage I hypertension=1%
40-60: obesity + hypertension = 1%, Obesity+ stage I hypertension=19.35%
>60: obesity + hypertension = 30.6%, Obesity+ stage I hypertension= 9.6

3.3. Females
Obesity: 30.52%
Hypertension: 33.68%
Stage 1: 30.52%
Obesity + hypertension: 14.73%
Obesity+ Stage I hypertension: 13.68%
Age <40: obesity + hypertension= 9.47%, Obesity+ stage I hypertension=11.57%
40-60: obesity + hypertension= 9.47%, Obesity+ stage I hypertension=12.63%
>60: obesity + hypertension=18.94%, Obesity+ stage I hypertension=12.63%

3.4. Obesity and sex incidence: Out of 219 people 142 (57%) are either overweight (27%) or obese (30%). Incidence of overweight and obese is more in the females 72.7% and males 58.4%. 41.1% of males are normal weight, 34.6% are overweight (24.4%) but only 27.3 of females are normal weight, overweight 42% and obese are 30%. More females are overweight and obese compared to males. (Fig 1

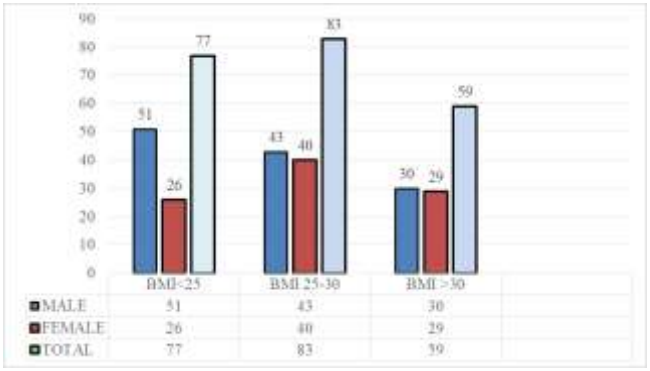

Fig 1: BMI and sex distribution

3.5. BMI and age group: 25 people were with normal BMI (below25) were below 40 years, 26 were between 40 to 60 years and 26 are above 60 years. People who are overweight (BMI 25-30) below 40 years are 8, between 40-60 years are 36 and above 60 years are 39. The people who are obese in the 40 years age group 6, 40-60 years 23 and above 60 years 30.

3.6. Incidence of hypertension: Out of 219 persons 93 (43%) were hypertensives and 71(32%) were stage I hypertension and only 55(25%) had normal blood pressure. (Fig 2)

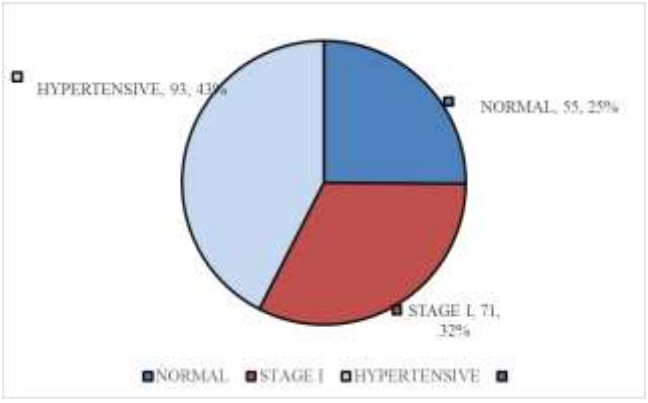

Fig 2: Incidence of hypertension

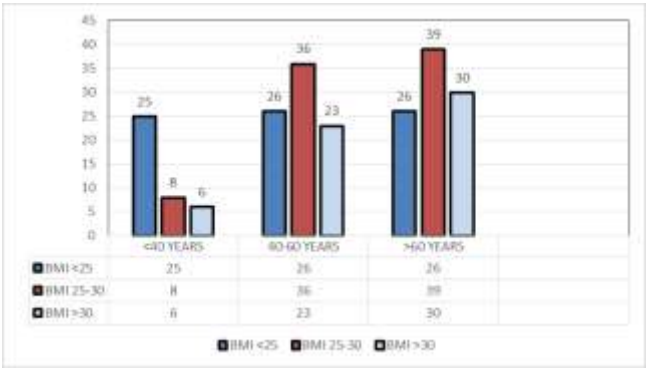

Fig 3: Hypertension and age distribution.

3.7. Hypertension sex and age distribution: Among 124 males 61 (49.2%) had hypertension and 42 had BP between 120/80 to 140/90 (33.8%) and 21 ((16.9%) had normal blood pressure. (Fig 5) Of the 61 hypertensive 38 (38/61=62%) were more than 60 years (61/124=30.6%). (Fig 3).
Among 95 females 32 (33.6 %) had hypertension and 29 (30.5%) had BP between 120/80 to 140/90 and 34 (35.7%) had normal blood pressure. Of the 32 hypertensive 18 were more than 60 years. (56%) Of the 32 hypertensives 6 were normal BMI, 26 (81%) were Overweight or obese (12 +14). (33.3% +43.7%) 29 females have 120/80 to 140/90 BP, Overweight or obese (14 + 12) (43.7%+33.3%) Out of 34 normotensives 6 were obese and 14 were overweight (43.7%). Among female more than 60 years 33.3% were obese and another 33.3% are overweight. (66.6% are above normal BMI).

3.8. BMI and hypertension: Of the 61 male hypertensives 22 (17.7%) were normal BMI, 39 (63.9 %) were Overweight or obese (11 +28).18%+ 9% = 27%, 42 males have 120/80 to 140/90 BP, Overweight or obese 13 (30.9%) are overweight and 13 were obese. (Fig 4) Out of 21 normotensives 6 were obese and 2 were overweight. (Fig 6), Among those whose had normal BMI the incidence of hypertension is 34 (male 28 & female 6) 44.1%, in overweight persons 40 (male 28 & female12) 48.2% and in the obese 25(male 11 female14) 42.37%. Among the sexes normal BMI males (43.15%) had hypertension and females

6 (23%), overweight males 28 (65.1%) and in overweight Females 12 (30%) and in obese males 11 (36.6%) and females (48.27%). In case of Stage 1 hypertension, normal BMI had 22 (28.27%), overweight 27 (32.5%) of them males 11(25.58%), females 14 (35%) and obese males 13 (43.3%) and females 9 (31%)

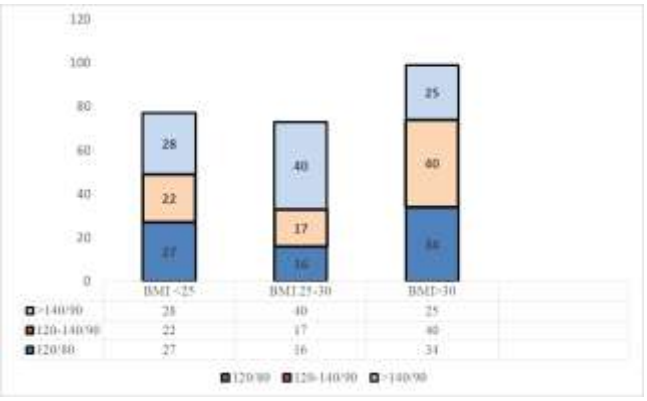

Fig 4: BMI and hypertension

4. Discussion

Obesity leads to disturbances in volume distribution and hepatic and renal clearance which produce resistance to antihypertensive medication. So, the obese hypertensive patients to achieve desirable blood pressure levels require a more "aggressive" antihypertensive treatment [1].

Obesity is due to the factors like rising income, urbanisation, changing lifestyles and genetic aspects. In Malaysia just over half of the population is either overweight or obese. Before 20 years only 4% of Malaysians were obese. According to the latest estimates from the World Health Organisation (WHO), 14% of Malaysians fall under the 'obese' category. A further 40% are overweight. In the last 45 years, fat intake has increased by 80% and sugar intake by 33%. Malaysians 18 years and above: 33.3% (5.4 million) are pre-obese, 27.2% (4.4 million) are obese, Children below 18 years 3.9% (0.3 million) are obese. In Malaysia 32.7% (5.8 million) of adults 18 years and above has hypertension**.**12.8% are known to have hypertension**,** 9.8% are previously undiagnosed with hypertension. Early prospective data from Framingham suggested that adiposity and 8-year changes in body fat may be associated with increased risk of hypertension [2]. In a Finnish cohort, overweight or obese people have increased risk of initiating antihypertensive drug treatment [3]. 50% of the hypertensives in the United States are obese and a third of obese people have high blood pressure levels compared to 20% in normal subjects [3]. A large cohort study of US women further demonstrated that both higher BMI and weight gain were directly associated with increased risks of developing hypertension [4]. The weight reduction is associated with both the primary prevention [5] and treatment [6, 7] of hypertension. Several studies confirm the benefits of weight reduction in the primary prevention of hypertension among the overweight and obese [8]. The specific biologic mechanisms by which higher BMI increases the risk of developing hypertension remain unclear. Several metabolic and neurohormonal pathways likely have complex interactions underlying the development of hypertension among the overweight and obese, including alterations in insulin resistance, the renin-angiotensin-aldosterone system, and sympathetic tone. Weight loss among obese individuals has been associated with improvements in insulin resistance, as well as decreases in norepinephrine, plasma renin activity, and aldosterone levels [9].

Bariatric surgery for obesity to control hypertension: Due to the difficulty in adhering to lifestyle changes there is low efficacy in lifestyle modifications and exercise as a treatment for obesity in obese hypertensive patients [10]. But bariatric surgery achieved a greater weight loss than that obtained with conventional treatment and it is effective treatment for patients with severe obesity [11]. Bariatric surgery favours the remission of obesity-related comorbidities like hypertension [12]. In a 31 prospective and 26 retrospective meta-analysis conducted by Wilhelm SM *et al* on the obese patients with hypertension who underwent different types of bariatric surgery like Roux-en-Y, gastric banding, laparoscopic adjust fig gastric banding, vertical gastric banding, sleeve gastrectomy, duodenal switch, and biliopancreatic diversion, 32 reported improvement of hypertension in 32 628 of 51 241 patients (63.67%) (Odds ratio [OR] = 13.24; 95% CI = 7.73, 22.68; P < 0.00001); 46 studies reported the resolution of hypertension in 24 902 of 49 844 patients 49.95% (OR = 1.70; 95% CI = 1.13, 2.58; P = 0.01). They concluded that those who underwent bariatric surgery experienced improvement in their hypertension control and of hypertension [13]. The effect of bariatric surgery on hypertension is lessened in the 10 years follow up remains a concern [14]. Surgically treated patients had a greater likelihood of remission and lesser likelihood for new onset of hypertension. Many studies consistently showed an improvement in hypertension one year after bariatric surgery, with remission rates above 60–70%. Compared bariatric surgery (92% gastric bypass) versus medical treatment with a median follow-up of 6.5 years, hypertension remission was 31.9% in the surgical group in comparison to 12.4% in the medical group. As to a longer-term follow-up, the recent cohort study published by Jacobsen *et al.* [15] Medication for hypertension was discontinued in 29% (n = 20/68) after sleeve gastrectomy and 51% (n = 37/73) after gastric bypass [16]. The primary endpoint (≥30% reduction of the total number of antihypertensive medications while maintaining systolic and diastolic blood pressure <140 and 90 mmHg, respectively, at 12 months) occurred more frequently in the gastric bypass group (83.7%) in comparison to the control group (12.8%). Moreover, hypertension remission, defined as systolic and diastolic blood pressure <140 and 90 mmHg, respectively, with previous withdrawal of all medication, occurred in about half of the patients submitted to the gastric bypass group and none in the conventional treatment group. The number of antihypertensive drugs prior to surgery was inversely related with hypertension remission after the surgery. A 36-month follow-up after surgery it is observed that 21.9% of the patients who had hypertension remission at 12 months presented a relapse at 3 years [17]. The bariatric surgery inn obese hypertensive, in addition to weight reduction, causes a decreased inflammatory response together with an improvement in insulin resistance which in turn decreases arterial stiffness and sodium reabsorption, and hence lead to normalization in blood pressure levels [18]. In addition, an increase in gastrointestinal gut hormones such as peptide YY and glucagon-like peptide-1 could also

be involved in hypertension remission, due to their effects both on the gastrointestinal system together with a diuretic and natriuretic effect on the kidney [19] In study patients with hypertension 2 or more medications to control hypertension with and a body mass index between 30.0 and 39.9 kg/m2 underwent Roux-en-Y gastric bypass plus medical therapy or medical therapy alone. The ≥30% reduction of the total number of antihypertensive medications to maintain blood pressure at <140 and 90 mmHg for 12 months occurred more frequently in the gastric bypass group (83.7%) in comparison to the control group (12.8%). Moreover, withdrawal of all medication occurred in about half of the patients who underwent gastric bypass surgery and none in the medical treatment group. [20] However the response to bariatric surgery depends on the number of antihypertensive drugs taken prior to surgery and weight loss during the first year. If the number of drugs more there is lower rate of remission at the end of first year after surgery and a higher recurrence at 3 years [21]. Bariatric surgeries represent an effective strategy for reducing antihypertensive drugs in patients with obesity and hypertension. Taken together with the improvement of the metabolic and inflammatory profile, such effects have the potential to reduce major cardiovascular events. Thus, gastric bypass represents 1 extra option to help achieve blood pressure control. As Bariatric surgery is associated with morbidity, patients with obesity and hypertension must be selected and submitted for bariatric surgery. Prevention of hypertension is workable if its awareness and knowledge of its risk factors are increased and this could lead to prevention of its complications [22].

Conclusion

This study shows that the incidence of stage 1 hypertension is high .to prevent these people developing hypertension some action must be taken. The recommendations are: Awareness campaigns: Malaysian Ministry of Health in the 1997 started taking steps by launching a healthy eating campaign to tackle obesity in the population. In the year 1998 “Less is More” campaign is started reduce sugar intake. “Life’s Sweeter with Less Sugar” campaign was started by Singapore in 2015 and encouraged the people to choose unsweetened drinks by offering ‘scratch and win’ cards upon purchase of relevant products. Another approach is to publish nutritional guidelines that advise consumers on how various ingredients affect their weight.

Early detection of obesity and hypertension can be done by conducting camps in the school, working place and wherever there is large gathering of people. All the people must be educated about obesity and methods of controlling it. For the morbid obese people, the bariatric surgery advantages can be told.

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