

# Management of the Metabolic Syndrome and the Obese Patient with Metabolic Disturbances: South Asian Perspective

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Rapid increase in obesity and related noncommunicable diseases is occurring in South Asian countries. Insulin resistance and clustering of proatherogenic, cardiovascular risk factors, also known as the metabolic syndrome (MS), are frequently seen in South Asians, even at a young age [1]. Persistent obesity dysregulates the metabolic processes, including action of insulin on glucose, lipids and free fatty acid metabolism, causing hyperglycemia, dyslipidemia, hypertension and MS. Further, obesity and MS are immediate precursors of type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD) [2].

Definitions for obesity (generalized and abdominal), MS, dyslipidemia, hypertension and hyperglycemia have been described in table 1.

*Management.* Increasing prevalence of obesity and related diseases in the South Asian population requires aggressive lifestyle management, including diet, physical activity and sometimes drugs.

Dietary management involves a well-balanced diet in accordance with body mass index, which contains 50–60% of carbohydrates (complex carbohydrates), 25–40 g/day of fiber, 10–15% proteins, <10% fats [saturated fatty acids: <10%, linoleic acid: 5–8% of total energy/day,  $\alpha$ -linolenic acid: 1–2% of total energy/day, *cis*-monounsaturated fatty acids (olive, mustard, rapeseed, rice bran and groundnut oil): 10–15% of total energy/day, trifluoroacetic acid (partially hydrogenated vegetable oils: vanaspati, margarine and reheated oils): <1% of total energy/day, cholesterol: 200 mg/day]. The total salt intake should be <5 g of sodium chloride (or about 2 g of sodium) per day [2].

*Physical Activity.* Regular physical activity reduces the risk of obesity and related disorders. The consensus physical activity guidelines for Asian Indians have been summarized in table 2.

**Table 1.** Defining obesity, abdominal obesity, MS, dyslipidemia, hypertension (HTN) and hyperglycemia in Asian Indians

Generalized obesity <sup>a</sup>	Abdominal obesity <sup>a</sup>	MS <sup>a</sup>	Dyslipidemia <sup>a</sup>	HTN <sup>b</sup>	Hyperglycemia [3]
<i>BMI cutoffs</i>	<i>WC cutoffs</i>	<i>WC</i>	<i>Total cholesterol</i>	<i>Pre-HTN</i>	<i>IFG and FPG concentrations</i>
Normal: 18.0–22.9	Men >90 cm	Men >90 cm	≥200 mg/dl	SBP 120–139 mm Hg	≥100 and <126 mg/dl
Overweight: 23.0–24.9	Women >80 cm	Women >80 cm (nonobligatory)	<i>TG</i>	DBP 80–89 mm Hg	<i>IGT</i>
Obesity: >25		<i>Blood glucose</i>	≥150 mg/dl	<i>HTN</i>	Elevated 2-hour FPG
		≥100 mg/dl	<i>LDL-c</i>	SBP ≥140 mm Hg	≥140 and <200 mg/dl after a 75-gram OGTT in the presence of an
		<i>HTN</i>	>100 mg/dl	DBP ≥90 mm Hg	FPG concentration
		≥130/≥85 mm Hg	<i>HDL-c</i>	<i>Consensus guidelines<sup>b</sup></i>	<126 mg/dl
		<i>TG</i>	Males <40 mg/dl	SBP ≥130 mm Hg	<i>Diabetes</i>
		≥150 mg/dl	Females <50 mg/dl	DBP ≥85 mm Hg	FPG ≥126 mg/dl
		<i>HDL-c</i>			
		Males <40 mg/dl			
		Females <50 mg/dl			

BMI = Body mass index; SBP = systolic blood pressure; DBP = diastolic blood pressure; FPG = fasting plasma glucose; HDL-c = high-density-lipoprotein cholesterol; IFG = impaired fasting glucose; IGT = impaired glucose tolerance; LDL-c = low-density-lipoprotein cholesterol; OGTT = oral glucose tolerance test; TG = triglycerides; WC = waist circumference.

<sup>a</sup> As used in the consensus statement for the diagnosis of obesity, abdominal obesity and MS for Asian Indians [4, 5].

<sup>b</sup> Classification according to JNC VII (Seventh Report of the Joint National Committee) criteria [5].

*Therapeutic Management.* Therapeutic intervention may benefit persons having obesity, MS, dyslipidemia or T2DM who have an increased risk of developing CVD, with advice on exercise and diet being an essential part of all treatment plans. As part of therapeutic interventions, several drugs can be used either solely or as part of combination drug therapy. Drugs like orlistat, which is used for the management of obesity, also reduce the risk of T2DM. Similarly, HMG CoA reductase inhibitors lower low-density-lipoprotein cholesterol and reduce the risk of CVD. However, some drugs used for the treatment of hypertension (e.g.  $\beta$ -blockers) may increase the risk of hyperglycemia and therefore need to be used with caution. Finally, to prevent obesity, the metabolic syndrome and T2DM among South Asians, it is particularly important to effectively implement and strengthen population-based primary prevention strategies.

**Table 2.** Summary of consensus physical activity guidelines for Asian Indians [6]

Disorders	Physical activity guidelines
Obesity	Moderate-intensity aerobic exercise: 60 min/day Vigorous-intensity exercise 60 min 3 or more days/week
Coronary heart disease and hypertension	The exercise sessions should be individualized according to the cardiac and physical status of the patient Usually, 210 min/week of moderate-intensity physical activity should be achieved Depending on the clinical condition, a low-intensity, individualized, supervised exercise program could also be devised
Diabetes	Daily physical activity of 60 min in duration including 10–15 min of resistance exercise and work-related activity

*Physical Activity Intensity Levels are defined in the following [6]:*

- (1) Low-intensity physical activity elicits a slight increase in breathing rate and is relative to a given individual (e.g. strolling <3 km/h on level firm ground, tidying the house, leisurely stationary cycling <50 W or <16 km/h and cooking)
- (2) Moderate-intensity physical activity elicits a moderate, noticeable increase in depth and rate of breathing while still allowing comfortable talking and is relative to a given individual (e.g. purposeful walking 3–6 km/h on level firm ground, water aerobics, cycling outdoors for pleasure at 19–23 km/h, cleaning the house, hiking and gardening)
- (3) Vigorous-intensity physical activity elicits a noticeable increase in depth and rate of breathing and will not allow an individual to speak more than a few words without pausing for breath (e.g. walking 1 km in less than 10 min, jogging, cycling outdoors at 23–26 km/h, aerobic dancing and jumping rope)

## References

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