**Hindu and Buddhist India**

There is a word ("*medas*") in the Sanskrit language that translates into excessive fatness, suggesting that obesity was a problem for at least some people in ancient India. Specific evidence of fat accumulation is again found mainly in sacred and medical writings. Indian dogtors noted an association between the accumulation of body fat and diabetes mellitus, and proposed specific treatments.

**Fig. 12**. Sushruta, Indian physician from c. 600 BCE. Source: https://www.google.ca/search?client=safari

Sushruta.tiff

Around 600 BCE, the physician Sushruta (**Fig. 12**) commented on two of the more important adverse medical consequences of obesity, diabetes mellitus and heart disease. He called diabetes "*Madhu‐meha*," noting "*a sweet taste and smell like that of honey*" in the breath of affected patients. He further distinguished a congenital form of diabetes, where patients were emaciated, showed excessive thirst and a loss of appetite, and an adult form. With surprising accuracy, he associated the latter with the choice of an "*injudicious*" diet, and symptoms that included "*obesity, voracity, a soporific tendency, and an inclination for lounging in bed or on a cushion"* (Bhishagratna, 2006; Haslam, 2016). Sushruta recognized the contribution of a sedentary lifestyle. He thus advised exercise as well as fasting and other depletory measures (Dods, 2013), replacing lounging in bed or sitting on a cushion by exercise and adopting an Ayurvedic diet. The therapeutic physical activity had to be performed daily and at least a moderate intensity was needed, although he cautioned that the half-maximum limit for exhaustion should not be exceeded (Tipton, 1985).

**Fig. 13**. Charaka, Indian physician from ~ 300 BCE. Source: https://www.google.ca/imgres?imgurl=http://www.brahmayurved.com/images/legendofayurveda/7624download.jpg

Charaka.tiff

One of the main subsequent exponents of Ayurvedic medicine and the 3 *doshas* was the physician Charaka (c .300 BCE)(**Fig. 13**). He underlined that a poor lifestyle shortened lifespan (Mondal, 2013). In his view, excessive corpulence was caused by "*an excessive intake of heavy, sweet, cooling and unctuous food, want of physical exercise, day sleep, uninterrupted cheerfulness, or a lack of mental exercise*." Diabetic individuals should practice regular physical exercise, including "*wrestling, riding on an elephant, long walks, pedestrian journeys, archery and casting javelins*." The Ayurveda also recommended the administration of testicular tissue as a cure for both impotence and obesity (Iason, 1946).

"*The Four Tantra*s" (Alphen & Aris, 1997) was for long the basic book of Tibetan Buddhist medicine. It was written in the 12th century CE, and it incorporated elements of Indian, Arabic, Chinese and Greek medical scholarship, with an emphasis on keeping 3 bodily humours in balance. The text noted that over-eating caused illness and shortened life span. In keeping with the passive and meditative philosophy of Buddhism, obesity was discussed as a problem that required catabolic treatment, to be sought through massage with pea flour, the eating of wolf flesh, and the use of enemas and compresses (Wolin and Petrelli, 2009 ). By the 12th century, many Buddhists also viewed obesity as evidence of moral failure (Stunkard, LaFleur, and Wadden, 1998 ).

***Conclusions***. Obesity was well-recognized in ancient India and Tibet, with an understanding of some of its complications and the prescription of specific exercise and dietary treatments.

**Fig. 14.** Shen Nung (c. 2695 BCE), considered as the father of Chinese medicine. Source:http://www.toxipedia.org/display/toxipedia/Shen+Nung

Shen Nung.tiff

**The Chinese dynasties**

Obesity was a problem among some of China's emperors, and it was sufficiently prevalent in ancient China that Chinese physicians and scholars proposed several remedies. On the other hand, comments in the available literature suggest it was an occasional problem of the wealthy, rather than a common occurrence in the average citizen. An examination of the 2200-year-old Terracotta Army of Chinese Emperor Qin reveals 8000 life-size figures, each with a unique face, clothing, and body build. Many are senior military officers, but others include accountants and administrators, and only one member of the group is obese- the Entertainer—clearly a passive occupation in the Royal Court.

In the Han dynasty, the mythical Yellow emperor Shen Nung (3000 BCE)**(Fig. 14**) is said to have discovered green tea, and he urged its consumption as a method to reduce obesity. In the *Suwen*, or *Book of Plain Questions* (Unschuld and Tessenow, 2011), Shen Nung conducted a dialogue with his medical advisers. Chapter 28 ("*A discourse thoroughly deliberating on depletion and repletion"*), states *"If obesity occurs in the nobleman and rich people, they must be over consuming heavy and greasy foods*." Associated risk factors were said to include undesirable eating habits, under exercising, body constitution and mental state.

In more recent times, a general in the Tang dynasty (An Lushan, 703-757 CE) suffered from gross obesity and was reputedly so fat that he caused more than one horse to collapse beneath his weight. He developed diabetes and eventually became blind. And in the Ming dynasty, the Wanli Emperor (1572-1620 CE) also banqueted his way to gross obesity, so that in his latter years he was unable to stand without assistance.

The placing of sharp objects in the pinna of the ear was plainly a potent aide-memoire when at the dining table, and this form of acupuncture was claimed to reduce appetite (Wolin and Petrelli, 2009). Other therapeutic suggestions included two ideas borrowed from the Buddhists (a vigorous massage of the body with pea flour, and the eating of wolf flesh), together with administration of an extract from the Thunder-God vine (a preparation that reduced the patient's appetite, apparently by enhancing the action of leptin).

***Conclusions***. The texts cited above point to the development of gross obesity in some of the elite in ancient China, but on the other hand the physique of the terra cotyta warriors suggests that this was an uncommon problem.

**Classical Greece and Rome**

On the island of Crete, the Minoan civilization flourished from the 15th century BCE. Not much is known about the health of this community. Evidence of gallstones and gout suggest that some of the wealthy may have indulged in over-eating (Shephard, 2015). On the other hand, short average heights and periods of growth retardation indicate the common people may have experienced periodic food shortages (Arnott, 1996). There were claims of a secret that allowed wealthy Cretans to eat as much as they wished without getting fat; possibly, they used some form of toxic purgative (Kelly, 2006).

Obesity features regularly as a medical disorder in the writings of physicians in classical Greece and Rome (Haslam, 2007). The number of such references suggests that obesity was a fairly common complaint, at least among aristocratic patients throughout the classical Greek and Roman periods, perhaps because an enormous number of slaves undertook most of the heavy physical work for the wealthy elite. As in other early cultures, the problem was sufficient to merit both description and the proposal of remedies. Hippocrates discussed the issue frequently, and even Plato expressed concern about immoderation in food consumption, partly for ethical reasons, but also because of the resulting health problems.

Lycurgus.tiff

**Fig. 15**. Lycurgus, the legendary Spartan lawgiver. Source: https://en.wikipedia.org/wiki/Lycurgus\_of\_Sparta#Education\_of\_children

On the other hand, the emphasis for the young Greek nobleman was on perfecting the body beautiful as an offering to the Gods. In Pindar's 11th Olympic Ode we read: *"Strength and beauty are the gifts of Zeus...natural gifts imply the duty of developing them with God's help*" (McIntosh, 1970). In general, because of the Greek emphasis on the balance of four body humours, for most physicians, the ideal body composition was found at the mid-point between fat and thin.

**Spartan attitudes**. Physical perfection was especially prized in Sparta. The legendary law-giver Lycurgus (c. 900-800 BCE) oriented Spartan society, both male and female, towards a tradition of life-long military fitness and austerity, based on guidance given by the Oracle of Apollos at Delphi (**Fig. 15**). The laws of Lycurgus established firm measures against laziness, muscular weakness and obesity both in Spartan youth and in society generally. Shortly after their birth, the

local elders inspected infants, and those that were puny or deformed were tossed over the cliffs at Mount Taygetus. Throughout their childhood, all Spartans followed a rigid physical regimen,and at the age of 18 years both men and women had to pass a rigorous physical fitness test. Those with the misfortune to fail the test lost both their citizenship and their political rights. Thereafter, the men who passed this test were required to maintain a high level of fitness and remain in the military reserve until they reached the age of 60 years (Shephard, 2015); any who became fat were banished from Sparta.

**Fig. 16**. Hippocrates of Kos (460-370 BCE). Source: https://www.google.ca/search?client=safari

Hippo.tiff

**Hippocratic medicine**. Even before the coming of Hippocrates,the Ionian philosopher Pythagoras (570-495 BCE) had already recommended eating in moderation.He commented adversely on those of his fellow-citizens who over-ate and then vomited or fasted. In a life of Pythagoras, the biographer Diogenes Laertius (3rd century CE) noted that the philosopher had recommended the wiser alternative of moderation: "*No man, who values his health, ought to trespass on the bounds of moderation, either in labour, diet or concubinage"* (Paredes, 2011). To this recommendation was added unction, bathing and exercises to increase bodily strength (MacKenzie, 1758).

The physician Iccus of Taranto (5th century BCE), himself an Olympic athlete and victor in the Games of 444 BCE, advanced similar views. He combined exercise with a frugal diet in order to preserve health. The 6th century CE philosopher Stepnaus of Byzantium commented that the saying "*the repast of Iccus,*" probably originating with Herodicus (below), had become a proverbial watchword for a plain and temperate meal (MacKenzie, 1758).

The 5th century BCE physician Herodicus, one of the teachers of Hippocrates, and sometimes considered as the father of sports medicine, claimed success in prolonging life, not least his own. He, also, underlined the need to regulate diet and exercise, and indeed he was censured in Plato's *Republic* for *"keeping people with crazy constitutions alive to old age*" rather than letting them *" die out of the way"* (MacKenzie, 1758). Herodicus advocated a systematic and strenuous exercise programme; many of his patients were prescribed repeated brisk 42 km walks from Athens to Megara at progressively increasing speeds. However, both Hippocrates and Plato thought he demanded too much of his patients, and Herodicus was said to have caused the death of several individuals by submitting them to excessively long walks and forced exercise.

Hippocrates of Kos (460-370 BCE)(**Fig. 16**) played a central role in revolutionizing Greek medicine, establishing it as a profession that was distinct from philosophy and the supernatural. He also seems to have been well aware of the harmful effects of obesity, noting the low resistance of the obese to febrile disease, and their increased risk of sudden death. Thus, he gave strict directions for the prevention and treatment of obesity. His remedies included severe physical labour before breakfast, a hard couch, a hardening of the body in the open air, the prohibition of warm baths and the avoidance of wine unless it was largely diluted with water.

He wrote: *"One cause which made it necessary to study the art of restoring lost health, was the great difference to be observed between the diet of the healthy and that of the sick*" (Rossen and Rossen, 2011). *"The men lack sexual desire because of the moistness of their constitution and the softness and coldness of their bellies. ... In the case of the women, fatness and flabbiness are also to blame... sudden death is more common in those who are naturally fat than in the lean*" (Haslam and Rigby, 2010). *"it is very injurious to health to take in more food than the constitution will bear, when, at the same time, one uses no exercise to carry off this excess*" (Wells, 2009).

Moreover, Hippocrates seems to have recognized that android fatness was more harmful than a gynoid distribution, and that the latter might even help outcomes during prolonged illness: "*In all maladies, those who are fat about the belly do best; it is bad to be thin and wasted there*" (Little and Frayn, 1986; Raisborough, 2016).

Hippocrates was particularly scathing about the Scythians in Persia, where he perceived a lack of daily activity from an early age. He commented *“The male children, until they are old enough to ride, spend most of their time sitting in the wagons and they walk very little... The girls get amazingly flabby and podgy*" (Haslam & Rigby, 2010).

**Colleagues and successors of Hippocrates**. The advice of both Greek philosophers and the medical colleagues of Hippocrates was that overweight individuals should "*reduce food and avoid drinking to fullness*," engage in regular exercise, *"running during the night*" and take "*early morning walks*" (Christopoulou‐Aletra and Papavramidou, 2004). Among the colleagues and successors of Hippocrates there are also recommendations of emetics. Thus hellebore plants and honey water were prescribed ‘"f*or the evacuation of the nourishment two or three times a month*"), along with cathartics (for example, scammony juice (bindweed), Cnidian berry and sea spurge) and laxatives (donkey milk with honey, wild parsley, dodder of thyme (Cuscuta epithymum), honey water and sweet wine) (Christopoulou‐Aletra and Papavramidou, 2004).

***Polybus***. In treating obesity, the physician Polybus (c. 400 BCE) generally followed the treatment plans of his father-in-law Hippocrates: *"Persons of a gross relaxed habit of body, the flabby, and red-haired, ought always to use a drying diet . . . Such as are fat, and desire to be lean, should use exercise fasting; should drink small liquors a little warm; should eat only once a day, and no more than will just satisfy their hunger "* (Haslam, 2007).

***Aristotle***. The philosopher Aristotle (384-322 BCE) was a strong believer in moderation: "*You may not live solely pursuing your base desires. Rather, you must subordinate them to right reason, and your life must be determined by the intellect, not by base desire."* "*both eating and drinking too much or too little destroy health, whereas the right quantity produces, increases or preserves it*" (Engel, 2002).

***Diocles***. Diocles of Carystus (240-180 BCE), regarded by Pliny as a physician who was second in wisdom only to Hippocrates, recommended that those who were obese should eat only once per day (Sydenham, 1844).

***Asclepiades***. Asclepiades (120-40 BCE) ptracticed medicine in Rome. He was an advocate of strong friction for the obese (Dublin University, 1861). Like Hippocrates, he believed that strong friction made the body harder.

***Celsus***. The Greek philosopher Celsus (~ 25 BCE) was sometimes criticized as *"a patron of gluttons and drunkards*" because he suggested that a person could *"indulge himself at feasts; . . . sometimes eat and drink more than is proper"* (Haslam, 2007). Nevertheless, Celsus advised an overall moderation in diet, and treated obesity by sea-bathing. He regarded a square, fit frame, neither thin nor fat, as optimal (Celsus, 1935). Like Asclepiades, he generally rejected purges and vomiting, but nevertheless he suggested that an excess of food could become corrupted, and then treatment by the induction of vomiting was indicated (Celsus, 1935).

***Dioscorides***. During the first century CE, the *De Materia Medica* of the physician Pedanius Dioscorides (40-90 CE) listed certain foods and herbal preparations that helped to reduce obesity; one particular recommendation included a mixture of Asian meadow, cheese and mustard (Dioscorides, 2003).

***Plutarch***. The essayist Plutarch (46-120 CE) commented on obesity and health, remarking that *“thin people are generally the most healthy; we should not therefore indulge our appetites with delicacies or high living, for fear of growing corpulent... The body is a ship which must not be overloaded”* (Sinclair, 1818).

Galen.tiff

**Fig. 17.** The Greek physician Galen introduced the first classification of obesity. Source: https://www.google.ca/imgres?imgurl=http://www.thefamouspeople.com/profiles/images/galen-1.jpg

***Soranus***. Soranus of Ephesus (98-138 CE) regarded obesity as a chronic disease in immediate need of treatment. He believed that obesity could narrow the birth passage and cause problems in childbirth, and by way of treatment he proposed a combination of diet and exercise, baths, venesection, purging and a radical change in lifestyle (Soranus, 1991).

**Views of Galen and his successors.** It is plain from the above comments that many Greek and Roman physicians recognized that obesity was unhealthy. In some instances, they also recorded and treated occasional cases of morbid obesity. Oribasius (325-400 CE), author of a 70-volume Medical Encyclopaedia, believed that obesity reflected a combination of flabbiness and excessive moisture, and he argiued that it arose from an inappropriate lifestyle: "*Non plus par nécessité, mais par suite du régime habituel, le corps des gens doué d'un tempéremant sec est plus dur et plus sec que celui des gens doué d'un tempéremant moyen. (Not only necessity, but also due to habitual lifestyle, the body of people with a dry temperament is harder and dryer than that of people with an average temperament)"* (Bussemaker and Daremberg, 1863). The condition required treatment by emaciation and fat reduction, achieved through exercise, diet, medications, baths, massage and provocation of what was termed *“mental anxiety.”*