

## **DISEASES OF CURRENT CONCERN**

This article gives a brief insight into some diseases of current concern worldwide and within our community. The topic is discussed loosely along the following:

1. Some diseases of current concern.
2. The concept of Lifestyle diseases and their prevention.
3. Know some Infectious diseases of current concern and how these could be kept under control.
4. Understand the impact of diseases on health and society.
5. Know some of the current topical diseases in some depth.

### **INTRODUCTION**

The pattern of diseases varies globally. However, some conditions are of general concern and are increasing in their importance in terms of human health and economic burden on society. These are the so-called **Lifestyle Diseases**. They have taken over from Infectious Diseases, especially in developed countries, as the major source of morbidity and mortality. They are rising in number due to a shift in disease pattern from infectious to those of chronic and debilitating in nature as a result of the success of *immunisation programmes* and *active effective preventive measures*.

On the other hand, within developing countries where overcrowding and poor sanitation are common, **Infectious Diseases** remain predominant. Other diseases come to prominence due to their uniqueness, their mode of transmission or their capacity to potentially become pandemic. Of particular concern to the Hong Kong public was the Avian Flu in 1997 which affected humans, when previously the H5N1 virus infect only various species of birds.

When discussing diseases, bear the following in mind:

- Many diseases are multifactorial (resulting from the interaction of many factors).
- Many diseases are related to one's lifestyle and the environment.
- The globalization of diseases is increasingly of significance due to the ease of transmission as a result of trade and travel. Population migration also plays a part in the introduction of certain diseases to other shores.

With the above in mind, we shall now discuss the Lifestyle Diseases and several Infectious Diseases of interest, be it in terms of their special relevance to Hong Kong, their general prevalence or their being topical in recent years.

## **LIFESTYLE DISEASES**

- Lifestyle Diseases, as the name implies, result from a less than healthy lifestyle. These used to be mainly diseases of the affluent and occur more predominantly in developed countries in the West. However, with the adoption of some Western dietary and daily habits by developing countries, these conditions are now important health issues worldwide. Together they generate high morbidity and mortality and have a huge impact on society both in terms of health and economic burden.
- The growing prevalence of obesity leads to a range of associated disorders including some cancers, heart diseases, stroke, high blood pressure (hypertension) and diabetes. A report from the WHO stated that obesity and a lack of exercise contribute up to a third of the cancers of the colon, kidney, breast and digestive system. A local study in 2001 documented that obesity in children is associated with impaired vascular function and early atherosclerosis.
- Cancer, heart diseases and cerebrovascular diseases (stroke) accounted for 59% of all deaths in Hong Kong in 1999.

## **OBESITY**

### **Prevalence**

- In 1995/1996 (Hong Kong), 32.6% of men were classified as overweight (BMI from 25.1-30) and 5.4% as obese (BMI >30). In women, the figures were 26.7% and 7% respectively.
- A more recent survey in by the Chinese University of Hong Kong found that of the 278 primary school students aged 9 to 12 surveyed, 48% were overweight. Half of these had two or more risk factors associated with coronary heart disease (including high blood pressure and a high cholesterol level). Another recent 2002 CUHK survey found that, of the 316 adults studied, 41.7% males and 40% females were obese. It was also found that up to 68% males and 38.4% of the females studied had two risk factors associated with coronary heart disease (compared to 12% and 8% respectively in a 1995 study).
- Another 1999 report from the US National Health and Nutrition Survey estimated that 61% of US adults are either overweight or obese with a BMI of >25. The associated illnesses resulting from this cause 300,000 deaths annually in the USA alone.

**Obesity** is defined as an excessively high amount of body fat in relation to lean body mass.

Body fat distribution can be measured by:

- **Body mass index**
- **Waist circumference**
- **Waist to hip circumference ratios**

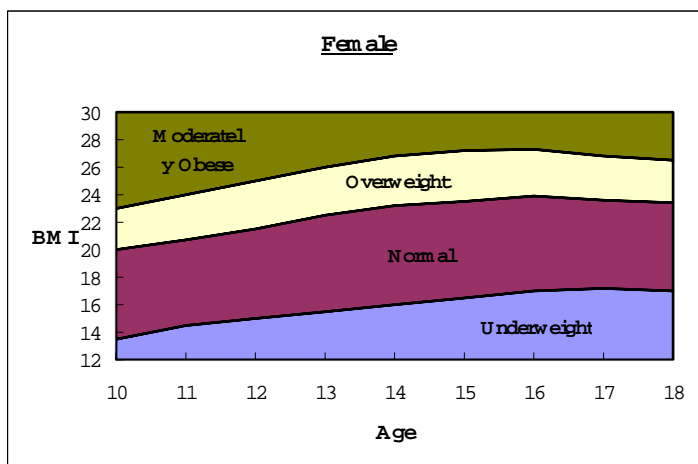
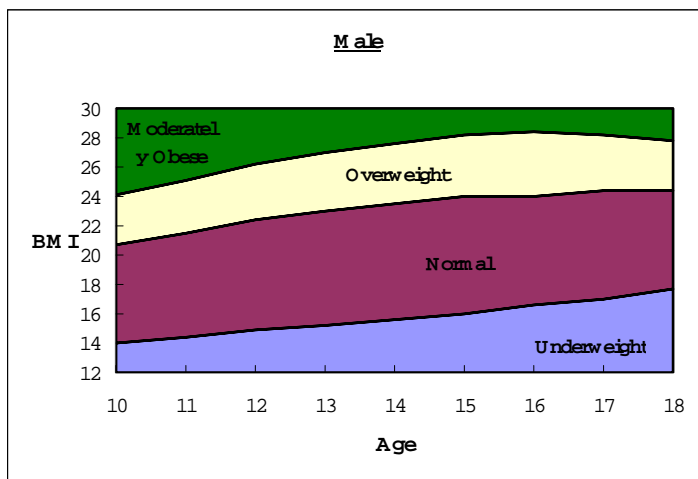
- **Imaging techniques** such as ultrasound, computer tomography (CT scan) or magnetic resonance (MRI).

**Overweight** means being heavy in weight in relation to height when compared to standards of desirable weights. Note that being overweight may not be the same as being “over-fat” as muscle is heavier than fat (e.g. in athletes).

**Body Mass Index (BMI)**

- A measurement expressing the relationship between weight and height but which correlates more with body fat than other indicators of height and weight.
- $\frac{\text{Body Weight (in kg)}}{\text{Height (in m}^2\text{)}} \quad \text{i.e.} \quad \frac{\text{Weight}}{\text{Height}^2}$
- Normal BMI of 18.5-22.9
- Overweight BMI of 23-24.9
- Obese BMI of 25-29.9 moderately obese; >30 grossly obese

(The above are WHO figures for Asians).



### **Waist Circumference**

- This measures the fat content in the abdomen, which is considered to be an independent predictor of risks associated with obesity.
- Men with a waist circumference of  $> 90\text{cm}$  (35.5inches)
- Women  $> 80\text{cm}$  (31 inches)

are considered at risk from obesity related diseases.

(WHO figures for Asians.)

### **Waist to Hip ratio (WHR)**

- Again, an indicator of abdominal fat. Excess fat in the abdomen carries increased health risk as compared to fat carried elsewhere in the body.
- WHR of higher than 1.0 is considered “at risk” for illnesses connected with being overweight.
- For Men ratio of  $<0.9$  is safe
- For Women ratio of  $<0.8$  is safe

(WHO figures for Asians).

### **CT scan and MRI**

- May also be used to define abdominal fat although obviously more costly.
- A CT (Computer Tomography) scan is a form of x-ray whereby a series of 3D pictures is taken of a specific area and fed into a computer for a more detailed picture of the body.
- A MRI (Magnetic Resonance Imaging) scan uses magnetic resonance which produces an even clearer image.

### **Overweight and Obese individuals are more prone to the following illnesses:**

- Coronary Heart disease
- High blood pressure
- Stroke
- Diabetes
- High Cholesterol level
- Obstructive sleep apnoea
- Some types of cancer (colon, breast)
- Arthritis and back pain
- Psychological problems (low self esteem)
- Gallstones

## CORONARY HEART DISEASE

- This is the number two killer disease in Hong Kong, after cancer. It remains the major cause of death in developed countries and is a disease of the affluence. It is estimated that currently it causes 900,000 deaths in the USA annually.
- In coronary heart disease, the coronary arteries, which supply the heart muscle with oxygen, are narrowed by fatty deposits called **atheroma**. As a result, blood supply to the heart is affected and the heart stops functioning, causing a **HEART ATTACK**.
- Coronary heart disease is closely associated with lifestyle factors. Obesity, a fatty diet, high cholesterol level (itself related to fatty diet), smoking, high blood pressure, high alcohol intake, lack of exercise, diabetes and stress are all contributory factors. In fact, many of the associated risk factors interact with each other.
- A recent CUHK study found that the physical fitness of an individual is inversely proportional to his blood sugar and blood lipid levels, indicating the cardiac protective effect of exercise. Another earlier study involving 100 obese children in 1999 showed a drop of cholesterol level by 6% (with the “bad” cholesterol dropping by 11%) after a 6 months’ weight management.
- Sometimes, a plaque of atheroma from a narrowed artery can break off and move up to an artery in the brain. It blocks blood supply to the brain causing a “brain attack” or a **STROKE**. Depending on the part of the brain affected, a stroke could lead to partial weakness of the limbs, trouble with communication, coma and death. It is the 3<sup>rd</sup> leading cause of death in Hong Kong.

### **Risk Factors associated with Coronary Heart Disease:**

- Overweight--- this puts an excess strain on the heart
- High Blood Pressure---again this results in the heart having to work harder
- Fatty Diet--- this increases saturated fat intake, which raises cholesterol level, blocks up arteries and also leads to obesity.
- Smoking---interacts with the other factors to increase risk
- High cholesterol level--- blocks arteries
- Sedentary lifestyle---leads to obesity and the other associated risks
- Diabetes---known risk factor
- Stress

### **How to prevent Coronary Heart Disease:**

- Eat A healthy diet.  
Eat food low in fat and cholesterol.  
Eat more lean white meat, fruits and vegetables.  
Use less oil in cooking. Grilling is healthier than frying.
- Control Blood Pressure  
High Blood Pressure (Hypertension) contributes to narrowing of the arteries and also puts extra strain the heart. People with high blood pressure should limit their salt intake and take their

medication regularly.

- Stop Smoking

Not only does this increase heart disease, it also increases the risk of lung cancer and strokes.

- Exercise regularly

Build an exercise programme into your schedule. Aerobic exercises three times per week at 20 minutes each session offer protective benefit.

- Manage your weight

A well balanced diet and regular exercise can help to regulate weight.

- Manage Stress

Recognise and list situations that cause stress. Avoid or find ways to cope.

Learn to relax.

- Know and beware of the other risk factors e.g. Diabetes.

#### Treatment of Coronary Heart Disease

- Treat associated risk factors as mentioned above e.g. medications to reduce blood pressure, cholesterol level, blood sugar etc.

- Coronary Angioplasty- in this procedure an inducer-catheter is inserted into the femoral artery in the leg and a dye injected to define any narrowed coronary artery. This could be viewed on a screen. If a blockage is detected, a thin tube with a balloon at its tip is threaded through the catheter-inducer towards the heart until it reaches the site of narrowing. The balloon is then inflated for a few seconds to split the fatty material blocking the artery to improve blood flow. The balloon catheter is then pulled back out through the inducer. The whole procedure is monitored via X-ray on a TV monitor. Readers can view the procedure on [medbroadcast.com](http://medbroadcast.com)

- Coronary By-pass Operation-in this operation a blood vessel from the leg is used to replace the diseased coronary blood vessel by by-passing the diseased portion. Blood can then flow from the aorta via the by-pass to the heart beyond the blockage in the coronary artery. Again you can view this surgical procedure on the website [medbroadcast.com](http://medbroadcast.com)

#### CANCER

Information on this number one killer in Hong Kong can be viewed in another article posted on this website.

## **INFECTIOUS DISEASES**

Infectious Diseases are caused by agents such as viruses, bacteria, fungal and other microorganisms including protozoa, rickettsiae etc.

The following are examples of either currently topical infectious diseases or those of emerging interest/significance particularly in Hong Kong.

### **INFLUENZA**

- Influenza is an acute infection of the respiratory tract caused by the Influenza A and B viruses.  
**A viruses** are subtyped according to the two surface antigens on the viruses---H for Hemagglutinin and N for Neuraminidase.  
**B viruses** have no subtypes.
- Influenza is an important illness with potential pandemic proportions. Epidemics of influenza typically occur during the winter months and can cause death from influenza related illnesses. Hong Kong has been designated as a National Influenza Centre of the WHO since the 1960's.
- There have been three flu pandemics (world wide epidemics) in recent history. In 1918, the Spanish flu swept globally, killing 40 million people. Avian flu strains caused two smaller pandemics in 1957 ("Asian flu") and 1968 ("Hong Kong flu"), each killing over a million people.
- The flu virus mutates easily and as a result, new virus strains develop against which human beings have no immunity and therefore could be deadly. Influenza Centres in different countries collect and identify changes and help contribute to the determination of vaccine strains by the WHO annually.
- Vaccines are especially recommended for people with lower immunity (the elderly, the chronically ill and young children) and health professionals in close contact with the sick.
- **The 1997 Avian Flu (H5N1) in Hong Kong** provided an example as to how a potentially pandemic strain of the virus was successfully terminated by prompt actions.

#### **The Influenza A (H5N1) Avian Flu in Hong Kong 1997**

- *In 1997, 18 residents in Hong Kong were infected with the H5N1 virus, which previously only affected birds, including chickens and ducks. Six of these people died.*
- *Infection with the virus is believed to be through contact with birds. The outbreaks of influenza A (H5N1) in chickens in Hong Kong during March/April and October/November 1997 were followed by occurrence of human cases on both occasions.*
- *There is no evidence as yet to suggest an effective person to person transmission.*
- *No new cases were reported after the prompt slaughtering of all chickens in local chicken farms, wholesale and retail outlets in Hong Kong during 29-31 December 1997. An estimated 1.5*

million chickens were killed. This timely intervention prevented the virus from acquiring the ability to spread among the human population.

- The environment in which man and animals, especially poultry, live in such close proximity in Hong Kong provided a unique situation for the development of the Avian H5N1 in humans.
- **The Sequence of Events** provided clear association between outbreaks of the disease in poultry and humans- only the timely intervention of chicken slaughtering prevented the disease from becoming a potential epidemic.

March/April 1997-----Avian flu outbreak in chicken farms in northwestern HK

9.5.1997-----Onset of first case of human influenza A H5N1

October/November 1997-----More outbreaks of avian flu in chicken farms.

November/December 1997---More human cases.

23.12.1997-----Import of poultry from the mainland suspended

28.12.1997-----Evidence of widespread H5N1 infection in a  
chicken farm and the wholesale market

29-31 December 1997-----Slaughtering of chickens and poultry

### **NO new human infections noted since**

However, Hong Kong is still troubled by outbreaks of avian flu amongst chickens and water birds. In February 2002, 22 farms in Yuen Long were infected leading to a cull of 940,000 chickens in 34 farms in the area. In December the same year, the same avian flu strain infected water birds (geese and ducks) from Penfold Park in Shatin indicating that the virus is now well adapted to the local environment.

Furthermore, recent studies by scientists from the University of Hong Kong indicated that the H5N1 virus became a killer because of its ability to produce a radical response from the body's immune system to the extent that the body started attacking itself. A small protein in the virus also protects the virus from the immune system's onslaught.

### **ENTEROVIRUS INFECTION**

- Enteroviruses are a group of small viruses.
- They are second only to the common cold viruses as the most common viruses in humans.
- These viruses are found in the respiratory secretions and stool of an infected person and are very infectious.
- Most infections are mild flu-like illness with muscle ache and a fever.
- They occur mainly in the summer and early autumn in temperate climates and year round in the



tropics.

- Some of these viruses cause the **Hand, Foot and Mouth Disease**.
- Enteroviruses are thought to play a role in the development of diabetes in genetically susceptible hosts.

**Hand, Foot and Mouth Disease:**

- *The disease is characterized by fever, a rash with blisters usually on the palms and soles and sores in the mouth.*
- *It is common in infants and children*
- *It is spread by direct contact of the infected person's stool or nose and throat discharges.*
- *Although the majority of HFMD present with mild symptoms, some may develop fatal complications.*
- *The **enterovirus EV71** causing HFMD may also cause meningitis, paralysis and affect the brain (encephalitis).*
- *Major outbreaks of HFMD due to EV71 have been reported in Malaysia in 1997 and Taiwan in 1998. In the Taiwan outbreak, 90,000 cases of HFMD were reported, 320 were hospitalized and 55 died. Deaths were mainly of children less than 3 years of age.*
- ***In Hong Kong**, the first fatal case of EV71 was reported in May 1999, in association with a HFMD outbreak in a nursery.*
- *Preventive Measures:*
  - Observe personal hygiene especially hand washing.*
  - Disinfect and clean toys in nurseries and playschools.*
  - Maintain good ventilation*
  - Keep infected children at home*
  - No vaccine is currently available for the non-polio enteroviruses.*

**FOOD-BORNE DISEASES**

Food-borne Diseases are diseases, either infectious or toxic in nature, caused by ingesting contaminated foods or drinks. They represent a widespread and significant public health problem, both in developed and developing countries.

**A. There are many types of food-borne diseases, some caused by the many disease-causing organisms/microorganisms.**

- Bacteria  
Commonest are by Salmonella and E.coli.  
Cholera caused by the bacterium Vibrio Cholerae is a major public health problem in developing countries.
- Viruses  
Hepatitis A virus
- Parasites  
Amoebiasis
- Worms  
Tapeworms, hookworms
- Toxins produced by microbes  
Toxins produced by the bacterium Staphylococcus aureus cause vomiting. The toxin produced by Clostridium botulism causes paralysis.

All of the above cause diarrhea, vomiting, abdominal pain and fever to varying degrees. Serious complications such as dehydration and septicaemia are rare except perhaps in cholera.

#### Preventive Measures:

- Keep hands clean. Wash hands before eating or handling food and after visiting the toilet.
- Clean, wash and cook food thoroughly
- Handle and separate raw and cooked food separately
- Refrigerate left over cooked food. Reheat thoroughly before eating.
- Rinse fruits and vegetables thoroughly
- Avoid semi-cooked food
- Avoid illegal hawkers.

***B. Other harmful chemicals and toxins can also cause food-borne diseases if they are present in food. These have become topical.***

#### 1. Biochemical toxins

Biochemical toxins such as marine toxins e.g. Ciguatera poisoning, are common in Hong Kong. This is caused by eating large coral reef fish.

##### ***Ciguatera Fish Poisoning:***

- *Associated with eating large coral reef fish, especially those over three catties.*
- *Large fish have a higher concentration of the toxin as they feed on smaller fish that feed on toxic algae that produce ciguatera.*
- *The head, viscera and skin have the highest concentration of toxins.*
- *The toxin cannot be destroyed by cooking.*

- *Those affected may complain of diarrhea and vomiting, numbness of mouth and limbs, joint pains headache and reversal of sensation of coldness and hotness.*
- *The poisoning is rarely fatal.*
- *Preventive measures: people should avoid eating large coral reef fish, avoid eating the head, skin and viscera of the fish and eat small and infrequent amounts only.*

**Mercury Poisoning:** By the same token, American researchers reported that eating large species such as tuna and swordfish even once a week may be linked to low level mercury poisoning as these fish accumulate mercury from consuming smaller fish. One's body weight also determines how much of these large fish one could eat regularly.

**Paralytic Shellfish Poisoning:** This is a food poisoning caused by eating affected shellfish (oysters, clams, mussels, scallops whelks etc.). The toxins originate from a number of plankton which live in seawater. Shellfish, because of their filtering habit, become poisonous when they ingest and accumulate poisonous plankton. The level of toxicity is related to the number of toxic plankton filtered, hence the shellfish become more toxic when there is a red tide (a concentration of toxic plankton in seawater or also called algal bloom). Toxic shellfish look, smell and taste normal and the toxin is heat stable. Symptoms include vomiting, dizziness, numbness or burning sensation of mouth, lips, tongue, fingers and toes. Death may occur from breathing difficulties.

## 2. Chemical Toxins

Poisoning by various chemical toxins frequently cause headlines in Hong Kong.

- Raw fruits and vegetables may be contaminated by *pesticides*. Affected persons complain of dizziness, numbness, palpitations and muscle weakness. Severe poisoning leads to convulsions and breathing difficulties. Prevent by eating organically grown fruits and vegetables; soak and wash fruits and vegetables thoroughly.
- More recently there have been cases of *Clenbuterol* poisoning in Hong Kong resulting from people eating pork contaminated by Clenbuterol (introduced to produce leaner meat). People affected developed palpitations, hand tremor and general agitation. Severe poisoning may also lead to convulsions.

## 3. Infection associated with a yet unknown "transmissible agent"

One such condition currently in the news and of public health interest is BSE and its link to a human form of the disease, vCJD.

***Bovine Spongiform Encephalopathy (BSE or Mad Cow Disease) and Creutzfeldt-Jakob Disease (vCJD)***

- *BSE is a transmissible and fatal brain disease affecting livestock and cloven hooves. This was first noted in the UK in 1986 and the epidemic spread was thought to be through cattle feed prepared from dead animals affected with the disease.*
- *In 1996, the disease came into prominence, following strong evidence linking BSE or "mad cow*

disease” with a human form of the disease called Creutzfeldt-Jakob Disease (vCJD).

- Both conditions have a long incubation period and cause fatal brain disease.
- From 1986 to 2001, more than 98% of cases of BSE worldwide were reported from the UK. In this period, approximately 180,900 cases of BSE were confirmed in the UK. As expected, the majority of human cases of vCJD occurred in the UK (101 cases up to June 2001).
- The potential spread of the BSE agent from the UK to other countries called for tight public control measures. Some examples in practice:
  - \*Prohibit the use of tissues likely to be infected from human and animal food chains (e.g. cattle feed prepared from dead and potentially infected cattle).
  - \*A highly effective measure applied in the UK is the “over 30 months scheme” whereby all animals over 30 months old and as a result are potentially infective are excluded from the human and animal food chains. Only those less than 30 months old from farms free of BSE are cleared for export.
  - \*In the USA, “blood donor deferral criteria” included those who had lived in the UK for 3 months or more from 1980 to 1996 and those who had lived for 5 years or more in the rest of Europe for the same period of time. There is a theoretical possibility of transfer of the BSE agent via blood products.
- To reduce possible risk of acquiring VCJV from food, travelers to Europe or areas at increased risk of BSE are advised to avoid beef products until BSE is completely eradicated.
- Note that milk and milk products are not known to be at risk for transmitting the BSE agent.

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**Author’s Note:**

The diseases discussed above barely scratched the surface of the topic. You may ask (and rightly so!): “ What about AIDS? What about Tuberculosis? What about Dengue Fever?” The list goes on... However, it is hoped that by understanding at least some diseases that are of current concern regionally and globally, the reader may be encouraged into taking part in the control and elimination of these diseases and also (hopefully!) be stimulated into seeking out information on other diseases of current concern that are not covered in this article.

Well, perhaps it is now time for the reader to look up AIDS, Tuberculosis...

\* Materials for this article are taken from lessons written for a Secondary level “Health Module” for the Education Department in 2002.