Non-Communicable Diseases Watch
July 2019

Anaemia : A Public Health Problem Worth Attention

Key Messages

※ Anaemia is the most common blood condition. Globally, around 2 billion people (or over 30% of the world's population) suffer from anaemia.

※ The most common cause of anaemia is deficiency in iron (which is an essential element for making red blood cells). In 2015, about 78 000 deaths were due to iron deficiency anaemia worldwide.

※ Young children (especially premature and low-birth-weight babies), pregnant women and women of reproductive age are the most vulnerable to anaemia. People with certain medical conditions, those who have certain eating patterns and elders may have a greater risk of developing anaemia.

※ Iron deficiency anaemia can largely be prevented by eating a balanced and varied diet with iron-rich food items. To get the most out of iron in foods, general public are advised to include vitamin C sources, eat adequate amount of meat and be alert of iron absorption blockers (such as tannin in tea and coffee).

This publication is produced by the Surveillance and Epidemiology Branch, Centre for Health Protection of the Department of Health
18/F Wu Chung House, 213 Queen's Road East, Wan Chai, Hong Kong http://www.chp.gov.hk

Anaemia: A Public Health Problem Worth Attention

Anaemia is the most common blood condition in which the body does not have enough healthy red blood cells, or the haemoglobin (Hb) levels fall below an established cut-off value (Table 1)[1], consequently impairing the capacity of the blood to transport oxygen throughout the body. As a result, people feel tired with other symptoms, such as pale looking, shortness of breath, rapid pulse, headache and dizziness. There are many types of anaemia, each with its own cause. Certain types of anaemia are more common, modifiable or temporary in nature, whereas some are genetically related, non-modifiable or chronic in nature.[2]

Global Situation

Anaemia is a significant public health problem in both developing and developed countries. Globally, the most significant contributor to the onset of anaemia is deficiency in iron (which is an essential element for making red blood cells). Anaemia can also be caused by other nutritional deficiencies (including folate and vitamin B12), inflammation (acute or chronic), infections (in particular malaria, helminth infections and tuberculosis), injuries, as well as other acquired or inherited disorders that affect haemoglobin formation, red blood cell production or survival (such as thalassaemia which is the most common monogenic genetic disease worldwide).[1, 3]

Anaemia can affect anyone, but young children (especially premature and low-birth-weight babies), pregnant women and women of reproductive age are the most vulnerable to anaemia because of high iron demands imposed by rapid growth in infancy and childhood, dramatic increases in maternal red blood cell production during pregnancy, or blood loss during delivery or menstruation. People with certain medical conditions (such as those who have internal bleeding, bone marrow disease, gastric bypass surgery or kidney dialysis treatment), those who have certain eating patterns (such as eating a diet that lacks iron-rich food items) and elders (because of presence of chronic medical conditions and poor diet) also may have a greater risk of developing anaemia.[4] For the year 2011, roughly 43% of preschool children (6−59 months) globally were estimated to be anaemic.[5] For women of reproductive age 15−49 years in 2016, 32% of non-pregnant women and 40% of pregnant women were estimated to be anaemic.[6] In the elderly population, a systematic review reported a weighted mean prevalence of anaemia ranging from 12% (elders living in the community) to 47% (elders living in nursing homes).[7] Globally, the World Health Organization (WHO) estimates that around 2 billion people (or over 30% of the world's population) suffer from anaemia.[3] Whatever its cause, anaemia can negatively affect physical function and compromise body immunity. When anaemia occurs in pregnancy, it would increase the risk of adverse birth outcomes including preterm birth, low birth weight, perinatal and neonatal mortality. In young children, severe anaemia can impair growth and cognitive development. Severe anaemia can cause low oxygen levels in vital organs such as the heart, and may lead to heart failure.[8] In 2015, WHO estimated that about 78000 deaths (43 000 for females; 35 000 for males) were due to iron deficiency anaemia globally.[9]

Table 1: Haemoglobin cut-off levels for diagnosing anaemia (at sea level)

Population	Haemoglobin levels (g/l)
Children 6–59 months of age	Below 110
Children 5–11 years of age	Below 115
Children 12–14 years of age	Below 120
Non-pregnant women 15 years of age and above	Below 120
Pregnant women	Below 110
Men 15 years of age and above	Below 130

Source: World Health Organization.

Local Situation

According to the Population Health Survey 2014/15 of the Department of Health (DH), 1.3% (2.1% for females; 0.4% for males) of community-dwelling people aged 15 and above self-reported that they had been diagnosed with anaemia by a Western medical practitioner. The prevalence of self-reported doctor-diagnosed anaemia was highest among females aged 45−64 (2.5%), followed by females aged 25−44 (2.4%).[10] Among children aged 14 and below, the Child Health Survey 2005/06 observed a parent- or self-reported prevalence of anaemia (and other blood diseases) of 0.5%.[11] Of note, self-reported prevalence rates might under-estimate the anaemic situation among Hong Kong general population. For pregnant women, Hb assessment is part of routine antenatal blood test. Clinical data of pregnant women attending Maternal and Child Health Centres of DH showed that the proportion of pregnant women with Hb 100 g/l or below decreased from 4.7% in 2010 to 2.6% in 2018.[12] In Hong Kong, about one in 12 people have thalassaemia minor (i.e. carriers of one defective gene)[13] in which some of them may be mildly anaemic. However, there are currently about 350 children, adolescents and adults with thalassaemia major requiring regular blood transfusions to sustain their lives.[14]

Controlling and Preventing Iron Deficiency Anaemia

Anaemia is interlinked with the five other global nutrition targets (stunting, low birth weight, childhood overweight, exclusive breastfeeding and wasting). In particular, the control of anaemia in women of childbearing age is essential to prevent low birth weight and perinatal or maternal mortality, as well as the prevalence of disease later in life.[15] For iron deficiency anaemia (and other nutritional deficiency anaemia), they can largely be prevented by eating a balanced and varied diet with iron-rich food items. Iron-rich food items include lean meat and seafood, eggs, soy bean and its product, fresh fruits and leafy dark green vegetables, dry beans and nuts. Of note, the haem iron found in meat and fish is much more easily absorbed by the body than non-haem iron found in plant foods. Besides, some dietary factors have been shown to influence the absorption of iron (Box 1).[16] To encourage members of the public getting enough iron from diet, the Hong Kong Red Cross Blood Transfusion Services and Kowloon Central Cluster published "Iron Feast" with various iron-rich recipes including ingredients and cooking steps. To view or download a copy, please visit https://www5.ha.org.hk/rcbts/UPFILE/BookFile/2018116175118547.pdf.

Box 1: General Tips for getting the most out of iron in foods [2, 16]

- **Include vitamin C sources**. Vitamin C is a very potent promoter of non-haem iron absorption. Serve iron-rich foods alongside foods containing vitamin C (such as tomatoes, broccoli, orange and kiwi fruits) or adding vitamin C-rich ingredients (such as pineapple or lemon juice) to dishes can facilitate the absorption of iron.
- **Eat adequate amount of meat**. Studies show that meat promotes the absorption of iron. For optimal health, adults in general are advised to keep consumption of lean meat, fish, egg and alternatives to 5 to 8 taels (about 190 to 300 grams, raw weight) a day.[17] For red meat, limit consumption to less than 19 to 20 taels (about 700 to 750 grams, raw weight) a week.[18]
- **Be alert of iron absorption blockers**. Some drinks and foods can block or reduce iron absorption, such as tannin in tea, coffee and red wine, or high-calcium food items like milk and cheese. Avoid these drinks and foods when eating foods high in iron, or take them 2 hours before or 1 hour after a meal if possible.

Furthermore, delayed cord clamping allows a physiological transfer of placental blood to the infant, providing the newborn sufficient iron reserve for the first 6−8 months of life. WHO recommends delayed umbilical cord clamping (not earlier than 1 minute after birth) for improved maternal and infant health and nutrition outcomes, including the prevention of iron deficiency anaemia in infants.[19] While breastmilk contains highly bioavailable iron and other nutritious ingredients, milk alone (breastmilk and/or infant formula) is no longer sufficient to meet babies' nutritional requirements from 6 months onwards, in particular their higher demand for iron. Parents shall offer babies iron rich first foods such as egg yolk, dark green leafy vegetables, livers, meat, poultry, iron fortified infant cereals, dry beans, tofu and fish. These foods can be pureed easily. In addition, the WHO's guiding principles for complementary feeding (children aged 6 months to 2 years) recommend that their daily diet should include fruit and vegetables. Lean meat, skinless poultry, fish or egg should be eaten daily, or as often as possible.[20, 21] Children aged 2 years or above can start eating a balanced diet in accordance with the Healthy Eating Food Pyramid for obtaining sufficient energy and optimal nutrients (including iron) from each of the basic food groups. Parents and carers should educate children how to make healthy choices. For more healthy eating tips during pregnancy and breast-feeding, or about optimal feeding practices for young children, please visit the DH's Family Health Service website at https://www.fhs.gov.hk/.

It is also noteworthy that cause should be found if diagnosed to have iron deficiency anaemia. Certain conditions such as gastrointestinal bleeding can occur slowly over a long period of time, and can go undetected. For persons who choose to take iron tablets or related supplements, they should be aware that iron tablets can affect their body to absorb other minerals and cause gastrointestinal discomforts. The supplement may also have the potential to interact with some medications. In severe cases, excessive intake of iron over time can lead to multi-system organ failure, and even death. It is thus important to check with a doctor or registered pharmacist before buying or taking any iron or other dietary supplements.

References

1. Haemoglobin Concentrations for the Diagnosis of Anaemia and Assessment of Severity. Vitamin and Mineral Nutrition Information System. Geneva: World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1).
2. Your Guide to Anaemia. Atlanta: National Heart, Lung and Blood Institute, National Institutes of Health, U.S. Department of Health and Human Services, 2011.
3. Joint Statement by the World Health Organization and the United Nations Children's Fund. Focusing on Anaemia. Geneva: World Health Organization, 2004.
4. Lopez A, Cacoub P, Macdougall IC, Peyrin-Biroulet L. Iron deficiency anaemia. Lancet 2015; 387(10021):907-16.
5. The Global Prevalence of Anaemia in 2011. Geneva: World Health Organization, 2015.
6. Global Nutrition Report 2017: Nourishing the SDGs. Bristol, UK: Development Initiatives.
7. Gaskell H, Derry S, Andrew Moore R, McQuay HJ. Prevalence of anaemia in older persons: systematic review. BMC Geriatr 2008; 8:1.
8. Iron Deficiency Anaemia. Assessment, Prevention and Control. A Guide for Programme Managers. Geneva: World Health Organization, 2001.
9. Global Health Estimates 2015: Deaths by Cause, Age, Sex, by Country and Region, 2000-2015. Geneva: World Health Organization, 2016.
10. Population Health Survey 2014/15. Hong Kong SAR: Department of Health.
11. Child Health Survey 2005/06. Hong Kong SAR: Department of Health.
12. Statistics on Anaemia in Pregnancy Women. Hong Kong SAR: Family Health Service, Department of Health.
13. Thalassemias (2012 Version). Hong Kong SAR: Clinical Genetic Service, Department of Health.
14. Statistics on Thalassaemia Major. Hong Kong SAR: Children's Thalassemia Foundation. Available at http://thalassaemia.org.hk/en/thala01.php. Accessed on 11 July 2019.
15. Global Nutrition Target 2025: Anaemia Policy Brief (WHO/NMH/NHD/14.4). Geneva: World Health Organization, 2014.
16. Hallberg L. Bioavailability of dietary iron in man. Ann Rec Nutr 1981; 1(123-47).
17. Healthy Eating Food Pyramid for Adults. Hong Kong SAR: Department of Health.
18. World Cancer Research Fund/American Institute for Cancer Research. Diet, Nutrition, Physical Activity and Cancer: A Global Perspective. Continuous Update Project Expert Report 2018.
19. Guideline: Delayed Umbilical Cord Clamping for Improved Maternal and Infant Health and Nutrition Outcomes. Geneva: World Health Organization, 2014.
20. Guiding Principles for Complementary Feeding of the Breastfed Child. Geneva: World Health Organization, 2003.
21. Guiding Principles for Feeding Non-Breastfed Children 6-24 Months of Age. Geneva: World Health Organization, 2005.

World Breastfeeding Week 2019
1-7 August

World Breastfeeding Week (WBW) is celebrated annually in the first week of August in more than 170 countries, aiming to bring worldwide awareness of protecting, promoting and supporting breastfeeding. For this year, the theme is "Empower Parents: Enable Breastfeeding". For more information about the WBW 2019 or past WBW, please visit http://worldbreastfeedingweek.org/.

WABA | WORLD BREASTFEEDING WEEK 2019
1-7 AUGUST 2019

Similar to previous year, DH will organise a series of publicity and education activities, including the **"Celebrating World Breastfeeding Week 2019" Event Day** on 27 July 2019. As part of the WBW celebration activities and to echo the theme of this year "Empower Parents: Enable Breastfeeding", the "Supporting Mothers' Breastfeeding Journey" Secondary School Short Video Competition was launched. The winning schools/winners will be invited to attend the prize presentation at the event day. To know more about the Secondary School Video Competition, please visit https://www.fhs.gov.hk/english/breastfeeding/bf_video_comp.html.

Non-Communicable Diseases (NCD) WATCH is dedicated to promote public's awareness of and disseminate health information about non-communicable diseases and related issues, and the importance of their prevention and control. It is also an indication of our commitments in responsive risk communication and to address the growing non-communicable disease threats to the health of our community. The Editorial Board welcomes your views and comments. Please send all comments and/or questions to so_dp3@dh.gov.hk.