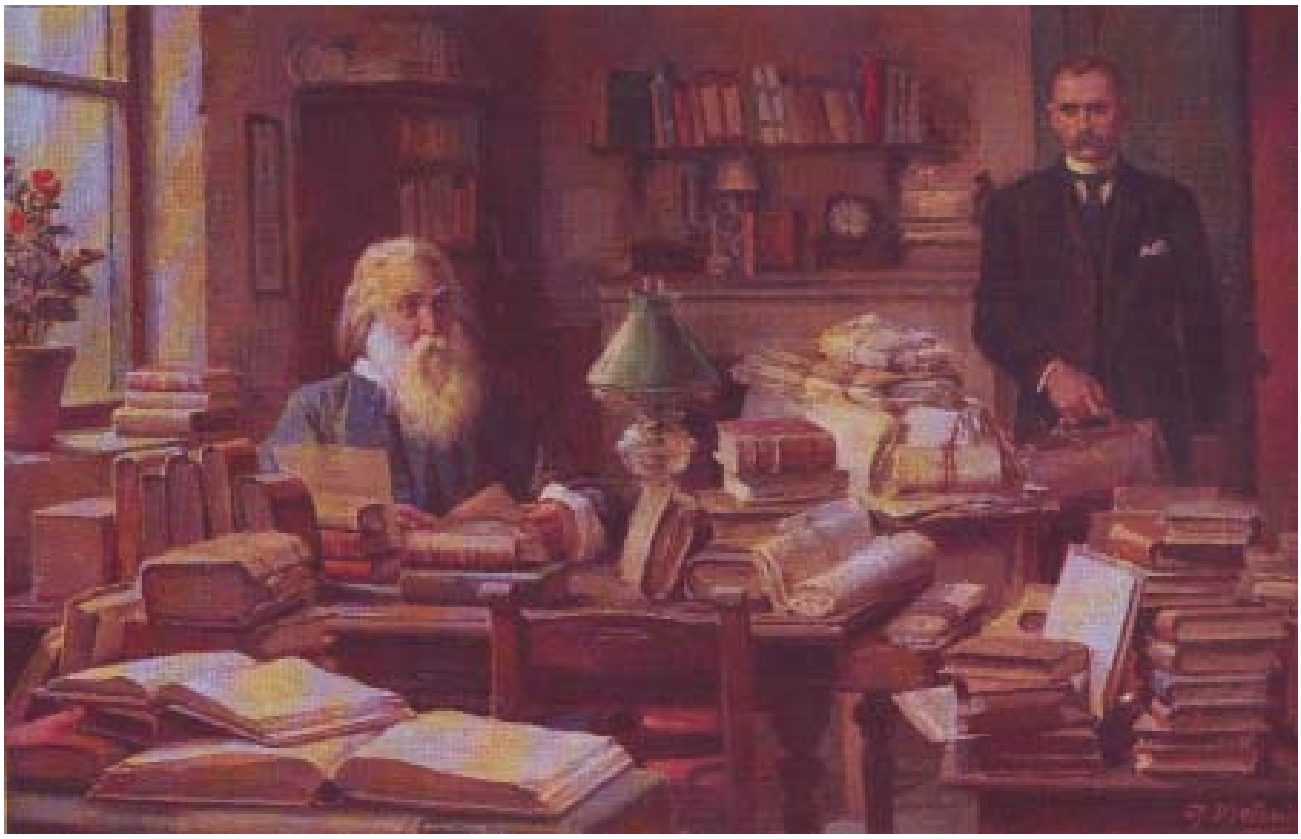
ISSN 1391-0736

The Sri Lanka Prescriber

December 2009; Volume 17, No. 4



CONTENTS

The Sri Lanka Prescriber *is sponsored by the State Pharmaceuticals Corporation of Sri Lanka as a service to the medical profession.*

The Sri Lanka
Prescriber

Copies of the *Sri Lanka Prescriber* and inquiries from M. P. Kuruppu, Deputy General Manager, Marketing, and Ms Sujathi Jayaratne, Promotional Manager, State Pharmaceuticals Corporation, P. O. Box 1757, 75, Sir Baron Jayathilake Mawatha, Colombo 1. Telephones 2328507, 2435441.

Price per copy Rs 50.00 (students Rs 25.00). Personal callers may also obtain copies from the Departments of Pharmacology at the Medical Faculties in Colombo, Galle and Sri Jayewardenepura.

Published by

Department of Pharmacology
Faculty of Medicine
271, Kynsey Road, Colombo 8, Sri Lanka.
Telephone: + 94 11 2695300 Ext 315
E-mail: phrm_cmb@hotmail.com
and
State Pharmaceuticals Corporation
75, Sir Baron Jayathilake Mawatha, Colombo 1.
Telephones + 94 11 2320356-9
Fax: + 94 11 447118
E-mail: prmanager@spc.lk Web site: www.spc.lk

Printed by

Ananda Press
82/5, Sri Ratnajothi Saravanamuttu Mawatha,
Colombo 13.
Telephone: + 94 11 2435975
E-mail: anpress@sltnet.lk

Cover picture

"Famous patients"; cover picture

Walt Whitman (1819-1892). American poet.

When the door of the patient's room at 328 Mickle Street was opened, Osler had difficulty at first in getting his bearings, for the floor, chairs, and table were littered with books, manuscripts, newspapers, and 'mysterious-looking literary bundles tied up with stout strings'. Near the window of the room the head and upper part of a man were visible –Walt Whitman, 'with a large frame, and well-shaped, well-poised head, covered with a profusion of snow-white hair, which mingled on the cheeks with a heavy long beard and moustache ... a fine figure of a man who had aged beautifully, or more properly speaking, majestically. The eyebrows were thick and shaggy, and the man seemed lost in a hirsute canopy'. The physician found only a slight residual weakness in the left leg. 'The machine was in fairly good condition, considering the length of time it had been on the road'.

Cheerful to the end ('Death is like being invited out to a good dinner'), Walt Whitman died on 27 March 1892. The post-mortern, performed by Henry W. Cassell, demonstrator of morbid anatomy at Pennsylvania University, showed a 'veritable pathological museum:' tuberculosis of the right lung, a large pleural effusion on the left side, parenchymatous nephritis, a fatty liver, gall-stones, cerebral arteriosclerosis, benign prostatic hypertrophy, etc. The poet's ruddy complexion, the history of pains and fullness in the head, and the cerebral attacks of varying intensity over a period of years are suggestive of hypertension.

[William Osler (standing) in Whitman's room, circa 1886. Osler was then Professor of Clinical Medicine in the University of Pennsylvania.]

Prescribing for the elderly

Introduction

Globally, over the past decade, there has been a striking increase in the proportion of elderly people, especially the very old. Sri Lanka has the fastest ageing population in south east Asia. The elderly are living longer because of improved standards of living, and the availability of social support and medical care. Although a few people may reach a very old age completely free of physical or mental ailments, most elderly people have one or more chronic diseases. As the prevalence of chronic diseases increases with advancing age, older people are more likely to have contemporaneously several conditions requiring treatment. Individuals over the age of 65 years are the greatest consumers of prescription drugs in most developed and developing countries.

Proper use of medication in the elderly confers many therapeutic benefits and improves functional outcomes, as well as reducing in morbidity and mortality. Elderly patients should not be denied the appropriate medications on the basis of age. Concurrently, clinicians should be aware of the increased hazards of multiple medications, such as side-effects, drug interactions and poor compliance, which are particular problems in the elderly. This article is the first in a series, discussing the appropriate use of medications for older adults.

Challenges in prescribing for the elderly

In the elderly, the actions of many drugs are significantly different from those observed in younger patients, because of age-related decline in the functional reserve of major organs, resulting in an increase or decrease in pharmacological effect, often accompanied by an increased likelihood of adverse drug reactions (ADRs).

Predicting drug action in the elderly is complicated by their heterogeneity, ranging from frail patients with a high burden of disease, to those with relatively normal major organ function. When treating elderly patients, the clinician must determine the optimum balance between beneficial effect and an acceptable level of often unavoidable ADRs. Finding the correct balance between effectively treating disease, while avoiding harm to the patient, can be challenging.

In the very old, manifestations of normal ageing may be mistaken for disease and lead to inappropriate prescribing. Age-related muscle weakness and difficulty in maintaining balance should not be confused with neurological disease. Nor should loneliness and sleeplessness be mistaken for depression, and ordinary forgetfulness regarded as dementia.

Drug related morbidity and mortality are potential threats to provision of good medical care for the older patient, and it increases healthcare costs. Many common problems in the elderly do not require pharmacological intervention and should be managed with other therapeutic approaches, eg. insomnia is a frequent complaint in the elderly and it may be more appropriate to prescribe a hot milk drink or a good book at bedtime than a benzodiazepine. Physiotherapeutic approaches to arthritis may be more successful, and are certainly less risky, than non- steroidal anti-inflammatory drugs.

The number of drugs prescribed should be limited to the few that are necessary. It is mandatory to obtain a complete medical history before prescribing, including details of past ailments, ADRs, allergies, use of alternative medications, and tobacco and alcohol misuse.

The use of prescribed medications should be reviewed regularly, and all unnecessary drugs should be discontinued. Attempts should be made to reduce the drug burden for the patient. Whenever a medication is necessary in the older patient it should be started at a lower dose, with gradual increases, and close monitoring for drug interactions and ADRs. Comprehensive instructions should be given regarding the intake, dosage and expected ADRs and the patient encouraged to report them as early as possible. Patients should be told what to do when drugs run out, and how to dispose of any that are no longer necssary.

Altered pharmacokinetics and pharmocodynamics with ageing

Pharmacokinetics in the elderly differs from that of younger patients owing to changes in organ function, drug bioavailability, distribution kinetics and changes associated with metabolic clearance.

Physiological changes

Alterations in neurological, cardiovascular, pulmonary, hepatic, renal, immunologic, and endocrine function may

increase sensitivity to drug effects in the elderly. For example, elderly patients may experience exaggerated responses to centrally acting drugs such as barbiturates, opioids, cyclic antidepressants and benzodiazepines. They are less able to regulate body temperature, making them more sensitive to drug-induced changes in thermoregulation produced by medications such as phenothiazines and anticholinergics.

Reduced baroreceptor sensitivity and responsiveness may increase the risk of postural hypotension associated with a variety of medicinal drugs such as phenothiazines, nitrates, nifedipine, prazosin, and diuretics. Concurrent use of central nervous system (CNS) active drugs may further potentiate postural instability, increasing the risk of falls. Older adults taking selective serotonin reuptake inhibitors are at greater risk of hyponatremia, probably related to increased susceptibility to the syndrome of inappropriate secretion of antidiuretic hormone.

Altered absorption

Changes in drug absorption and age-related changes in the drug distribution may alter the predicted plasma level of medications. For example, drugs that slow gastro-intestinal motility, such as antihistamines or opioids, alter the absorption of many drugs. Alterations in the fat-to-lean body mass ratio may lead to higher blood levels of medications such as morphine, lithium, levodopa, digoxin and acebutolol, and lower plasma albumin levels may decrease the protein binding of medications such as sulfonylureas and anticoagulants, thereby potentiating their effects.

Metabolism

Changes in drug metabolism can also lead to exaggerated drug responses in elderly patients. Phase I metabolism (oxidation and reduction) is reduced in older adults. An example of altered metabolism that leads to increased bioavailability and higher blood levels, is decreased first-pass metabolism. Medications that are affected by slowed first-pass metabolism include propranolol, verapamil and nifedipine.

Renal changes

Lower glomerular filtration rate, decrease of tubular function, and decreased tubular reabsorptive capacity may occur with advancing age. Renal drug clearance is consistently diminished with ageing though the degree of impairment may vary with the individual. Drugs which are eliminated via the kidneys will have significantly delayed elimination in the elderly leading to higher plasma concentrations and toxicity, eg. aminoglycoside antibiotics, digoxin and lithium. Equally important is the recognition of medications that directly alter renal function. For example, lithium intoxication can occur with addition of a thiazide diuretic, ACE inhibitor, or non-steroidal anti-inflammatory drug.

Adverse drug reactions

Adverse drug reactions (ADRs) account for a significant proportion of hospital admissions. The risk of ADRs increases with age and the number of drugs prescribed. Several factors account for this, as shown in panel 1.

Panel 1. Factors that increase the risk of adverse drug reactions

- Altered pharmacokinetics and pharmacodynamics that occur in ageing.
- Increased sensitivity of diseased tissues to drug toxicity.
- Potential drug interactions.
- Difficulties in patient compliance with multiple medications.
- Prescription of drugs that are unnecessary for the treatment of ailments that are better managed by non-drug means.
- Inappropriate prescription of drugs that are either contraindicated, or prescribed in combination with other drugs that precipitate drug interactions.

Compliance

Poor compliance with medication is also a common problem in the older patient. Polypharmacy aggravates it. The problem will be greater if the patient has dementia or depression. Some older patients who are acutely ill may be tempted to take more than the prescribed dose of a medication in the mistaken belief that more of the drug will speed the recovery. Educating the caregiver regarding the dosage, frequency, and ADRs should be part of the medical care, as it improves compliance and prevents inappropriate discontinuation of medication (Panel 2).

Panel 2. Appropriate prescribing in the elderly

- Whenever possible obtain a complete medical history and avoid prescribing before a diagnosis is made.
- Use non-drug therapy if drugs are not essential.
- Medications should be prescribed when indicated and not withheld because of age.
- Start with a low dose and use simple regimens.
- Limit medications to the minimum essential number.
- Review the medication regularly.
- Educate the patient and family regarding the need for the medication, and the duration and expected side-effects and ADRs.
- Arrange for follow up care to assess efficacy and to look for ADRs.
- Avoid using one medication to counter the adverse effects of another.

Suggested reading

1. Laroche MC, Charmers JP, et al. Inappropriate medications in the elderly *Clinical Pharmacology and Therapeutics* 2008; **85**:194-7.

2. Turnheim K. Drug dosage in the elderly. Is it rational? *Drugs and Aging* 1998; **3**: 357-79.

3. Hammerlein A, Derendorf H, Lowenthal DT. Pharmacokinetic and pharmacodynamic changes in the elderly. Clinical implications. *Clinical Pharmacokinetics* 1998; **35**: 49-64.

4. Hayes BD, Wendy PD, Schwartz K, Barrueto F. Polpharmacy and the geriatric patient. *Clinics in Geriatric Medicine* 2007; **23**: 371-90.

Dr. Achala Balasuriya, MBBS, MD, *Consultant Physician, General Hospital, Vavuniya.*

E-mail: <achalabal@live.com>

Conflicts of interest: none declared.

No evidence for routine use of progestogens to prevent abortions

Background: A 27-year old primigravida who had conceived within 9 months of marriage and is 12 weeks pregnant is prescribed progestogen. The possible indication is for prevention of abortion. On inquiry from obstetric colleagues it transpires that although it is not common to see progestogens being prescribed to primigravidae, it is not at all uncommon to see progestogens being prescribed to those who have had one or two abortions.

Concern: Every article on prescribing during pregnancy reminds medical practitioners about the possible harm that drugs can cause to the foetus and advises them to avoid unnecessary prescribing. The message to use drugs when absolutely necessary (especially during the early weeks of pregnancy) is reiterated.

As medical practitioners have to practice evidence-based medicine we attempted to find the evidence for this practice.

The evidence: A recent Cochrane review has looked at the efficacy and safety of progestogens as a preventive against abortion (1). The review has included data from 15 randomised and quasi-randomised clinical trials having a total of 2118 participants. The metaanalysis of all women regardless of gravidity and number of previous abortions showed no significant difference in risk of abortion among progestogen treated or placebo or no treatment groups. No differences were seen in the incidence of adverse effects in either the mothers or babies.

A subgroup analysis (of 3 trials out of the 15) involving women who have had 3 or more consecutive abortions has shown a beneficial effect of progesterone, but the authors emphasise the need for larger studies.

Conclusion: The authors of the Cochrane review conclude that there is no evidence to support the routine use of progestogens to prevent abortions in early and mid-pregnancy.

In the light of the above findings we have to conclude that the practice of routinely prescribing progestogens to prevent abortion is not evidence-based. This practice should be discontinued.

This recommendation will not apply to those conceiving following assisted reproductive technologies.

Reference

1. Hass DM, Ramsey PS. Progestogens for preventing miscarriage. Cochrane Database of Systematic Reviews 2008, Issue 2. Art No.:CD003511.DOI: 10.1002/14651858.CD003511.pub2

Dr. S. A. C. Senadeera, MBBS, *Research Assistant* E-mail: <chamalke@gmail.com>

Professor R. L. Jayakody, *Professor, Department of Pharmacology, Faculty of Medicine, Kynsey Road, Colombo 8.* E-mail: <jayakodyrl@hotmail.com>

Conflicts of interest: non declared.

Prescribing for the blind and the partially sighted patients

Introduction

Issues related to prescribing medicines for blind patients and those with severe visual impairment is an under explored and neglected area. Healthcare professionals and prescribers need capacity building to manage prescription related needs of such patients.

According to WHO statistics in 2009 over 314 million people in the world are visually impaired, and 45 million of them are blind. Over 87% of these visually impaired people live in developing countries. The degree of visual impairment may vary widely among them. Some have no useful vision whereas others are partially sighted. The partially sighted individuals also differ in their type and level of visual disability. Some of them can read larger fonts whereas some can only identify objects of the surroundings such as medicine containers. Some can recognise colours and some can see better when the background colour contrast is adjusted.

Some have congenital visual impairment. Some have acquired visual impairment early in life due to trauma or conditions such as retinitis pigmentosa, vitamin A deficiency etc. Some develop poor vision or total visual loss later in life due to diabetic eye disease, glaucoma, or macular degeneration.

As a result their level of disability and capabilities show wide variation, and there is no one remedy that will suit all. The doctor who is prescribing medicines for a visually impaired patient should appreciate these issues and be sensitive to the difficulties faced by them to maximise the effective and safe use of prescription medicines. Some patients who are partially sighted may not reveal this crucial information to the prescriber. Therefore whenever prescribing medicines to a patient inquire regarding possible visual disabilities.

Ways of improving doctor-patient communication

The following are some useful measures when prescribing medicines and communicating medicine related information to the blind or partially sighted patient.

- Talk to the patient loud and clear.
- Repeat the important advice and instructions.

- Ask the patient to repeat the advice and instructions given.
- Ask the patient whether he or she has any difficulty understanding the advice and instructions. If so identify the difficulties and clarify.
- Remember that verbal instructions and advice can easily be forgotten and the importance of providing memory aids such as audiotaping of instructions.
- If the patient can read larger font sizes, written information (hand-written or printed) in appropriate larger font sizes could be used to reinforce the medicine information. Such patients may be able to read letters written in bold black on white paper and medicine information leaflets developed in larger fonts. Ask the patient to read some of the written information in your presence before he leaves the consultation room, to make sure that your handwriting is clear and legible to your patient.
- If the patient has a portable cassette recorder and knows how to operate it, encourage him to bring it when he comes to see you next and when he goes to the pharmacy to buy the medicines. This would enable recording of the instructions given by the doctor and pharmacist, and serve as a useful aid to memory.

Select appropriate dosage forms

It is important to select dosage forms of medicines the patient can use more easily. Most blind people find it easier to handle tablets and capsules rather than liquid medicines and powders. Requests to divide tablets into 2 or more parts or to crush tablets into powdered forms is inappropriate because this is a difficult task for the visually impaired patient.

"The doctor gave 3 medicines to be given to my 1-year old son. He asked me to divide one tablet into 3 so that 1/3 of the tablet could be given to my child at a time. I tried my best to do this but lost one piece of the tablet in the process. I don't think I divided it into equal parts either. The medicine powder given was also difficult to give. I do not know whether I gave the full amount or left behind and spilled some of it". This information was disclosed to me by a visually impaired parent.

When giving inhalers for asthma the metered dose inhaler may be easier to handle than the dry powder inhaler since dry powder inhalation usually involves taking the medicine capsule out of the foil, inserting it into the chamber in the inhaler device, crushing the tablet to release the powder and inhalation. If you are prescribing more than one inhaler type try to prescribe ones having different shapes to enable recognition by touch. Alternatively a method can be created by using elastic or thick rubber bands around the inhalers to indicate the different ones. For example, steroid inhalers which are usually given regularly as a twice daily dose can be indicated by two bands around the inhaler, whereas reliever inhaler can be left without a band.

When using insulin, the pen device may be easier to handle than the insulin needles, syringes and vials. Most pen devices make a clicking sound on rotating the dial of the pen to enable patients with poor vision to recognise the number of units selected for injection.

Simplify drug regime to improve compliance

Avoid complex regimes and frequent dosing intervals. For instance once or twice daily regimes are better suited than three times or four times a day regimes. Minimise the number of medicines prescribed. Complex regimes, increased number of medicines, and difficult to use dosage forms are known to lead to poor compliance to treatment, adverse effects, poor therapeutic efficacy, and breakdown of trust and confidence in the prescriber.

Instruct regarding safe storage of medicines

The medicines should be kept in one place that is easily accessible to the patient. Stress the importance of keeping them out of reach of children. Let trusted residents at home such as relatives know where the medicines are stored so that they can access the medicines in an emergency. They should also have the necessary knowledge regarding the medicines taken by the patient to remind and assist him in taking them.

Improve ability to use medicines safely and independently

Advice partially sighted patients as follows to improve their ability to use medicines safely and independently. Points 6, 7, 8 and 9 are applicable to blind patients as well.

1. Get vision corrected to the maximum possible level by appropriate spectacles.
2. Use a magnifying glass to identify medicines, their containers and medicine instruction labels better.
3. Organise the home environment in such a way that the lighting and colour contrasts of the environment is optimum to aid vision.
4. Use different sized and shaped containers to store different medicines so that the patient can be assisted by touch to identify medicine containers.

5. Use containers of different bright colours to store medicines if the patient can differentiate between colours.
6. Ask patient and caregivers to prepare medicine instruction labels in large bold print.
7. Use memory aids such as putting elastic bands around containers to indicate the number of times the medicine need to be taken.
8. When using medicines, to keep the medicines and the containers on a broad even surface such as a table top or tray to avoid the risk of spilling and loosing medicine containers and tablets.
9. Single doses of tablets and capsules to be taken at one particular time of day (eg. in the morning) can be put in the same container when timing of administration of individual medicines in relation to meals was not a major issue.
10. When using several medicine containers, only one should be handled at a time.

Help develop self-confidence

The prescriber should win the trust of the patient, build confidence and empower the patient to use medicines as independently and safely as possible. However, the patient should not take unnecessary risks or face disappointment and frustration by trying to handle medicines without asking for assistance when necessary. The family members should be educated to help the patient be independent as much as possible and to provide assistance when necessary. Overprotection and excessive involvement of family members in these issues would create dependence, poor self-confidence and lack of motivation in the patient.

Help improve medicine related general knowledge

The prescriber should encourage and assist the visually impaired patient to improve general knowledge related to medicine use by promoting access of available medicine information sources such as radio, television, audiotapes, doctors, and pharmacists.

Visually disabled students at the special schools for them in Sri Lanka are proficient in Braille and have access to electronic media such as computers and internet. They are provided the facility of reading newspapers assisted by a special computer software. Some visually disabled adults also have access to computers. These sources and assistive technologies are at the moment hardly utilised to provide medicine information in Sri Lanka and should be used by prescribers to provide general medicine and health information to these groups.

Suggested reading

1. World Health Organization. Visual impairment and blindness. Fact Sheet No.282 May 2009. [http://www.who.int/media centre/fact sheets/fs282/en/] (last accessed 05th October, 2009).
2. Meredith B. Informing patients about the drugs they take. *British Medical Journal* 1996; **313**: 315.
3. Brain and Spinal Foundation. Providing information to people who are blind or partially sighted [www.rnib.org.uk] (last accessed 10th October, 2009).
4. Eileen Rivera Ley. Winning Strategies for Tracking Medicines When Vision is Failing. Voice of the Diabetic Vol.22 No.3 Summer Edition 2007. [http:www.nfb.org/Images/nfb/Publications.html] (last accessed 10th October, 2009).
5. Raynor DK, Yerassimou N. Medicine information: leaving blind people behind? *British Medical Journal* 1997; **315**: 268.

Dr. Chamari Weeraratne, MBBS, MD, *Senior Lecturer in Pharmacology, Faculty of Medicine, University of Colombo.*

E-mail: <chamariweera@hotmail.com>

Conflicts of interests: none declared.

Management of childhood obesity

Incidence of childhood obesity in Sri Lanka is on the rise. Prevalence of obesity in Colombo District is about 3.5-4%, and 10-12% are overweight. However, there could be sectoral prevalence variability.

Childhood obesity is associated with many adulthood non-communicable diseases, and most of the pathological changes related to obesity start in childhood. Early recognition and weight reduction will reverse many changes and reduce later complications. The mainstay of management is to bring about a change in lifestyle. Success of treatment depends on the degree of motivation, commitment and the involvement of the family.

Diagnosis of obesity

Obesity is having excess body fat associated with adverse health outcomes. As it is not possible to measure body fat in clinical practice body mass index [BMI= weight (kg) / height^2(m)] is used. In children the BMI changes with age and sex, and centile charts are used. BMI ≥ 95th centiles is considered obese, and between 85th and 95th is taken as overweight (or risk of becoming obese). Gender specific WHO or NCHS/CDC 2000 BMI growth charts can be downloaded from WHO and CDC websites.

How do children become obese?

Obesity occurs when there is an imbalance between energy intake (food intake) and energy expenditure (physical activity). Rarely it could be due to disease. The resulting energy surplus will be deposited in the body as fat.

Complications of childhood obesity

Physical consequences

- Pulmonary: Sleep apnoea, asthma, Pickwickian syndrome
- Orthopaedic: Slipped upper femoral epiphysis, Blount's disease, flat feet, increased risk for fractures
- Neurological: Pseudotumour cerebri
- Gastrointestinal: Cholelithiasis, non-alcoholic fatty liver disease (NAFLD), non-alcoholic steato-hepatitis (NASH), gastroesophageal reflux disease (GORD)
- Endocrine: Insulin resistance, impaired glucose tolerance, type 2 diabetes mellitus, polycystic ovarian syndrome
- Cardiovascular: Hypertension, dyslipidaemia, fatty streaks in blood vessels

Psycho-social consequences

- Low self-esteem
- Poor school performance
- Low marriage prospects
- Low job opportunities

Two important illnesses that occur in children with obesity are metabolic syndrome (MetS) and non-alcoholic steatohepatitis (NASH). Most obese children remain as obese adults and the pathogenesis of many obesity related illnesses begins in childhood.

Childhood metabolic syndrome

MetS is also known as Syndrome X or insulin resistance syndrome. It could be considered as a pre-diabetic state which may progress into type 2 diabetes mellitus and cardiovascular disease. A consensus definition for the diagnosis of metS recommended using the adult definition for children above 16 years of age. Children less than 10 years need to be investigated if risk factors such as strong family history, dyslipidaemia, type 2 diabetes, cardiovascular disease, hypertension or obesity are present. Therefore a childhood definition of obesity is made only in children between 10 and 16 years of age.

Diagnosis is based on criteria and requires the absolute criterion plus two out of the other criteria. The absolute criterion is central obesity, and waist circumference is used to determine this. Results are interpreted using centile charts. The child should be without clothes or wearing minimum thickness clothes. The examiner stands in front of the child and marks the lower margin of the ribcage and the upper margin of the iliac crest on both sides in the midaxillary line. Taking the middle point between those 2 marks and keeping the measuring tape horizontally, measure at the end of a normal expiration. Sri Lankan centile charts are not available and an internationally accepted chart may be used.

Other criteria are:

1. Increased triglycerides ≥ 1.7 mmol/l (≥ 150 mg/dl)
2. Reduced HDL ≤ 1.03 mmol/l (≤ 40 mg/dl)
3. Hypertension Systolic BP ≥ 130 mmHg

   Diastolic BP ≥ 85 mmHg
4. Impaired fasting plasma glucose >100mg/dl (5.6 mmol/l) or type 2 diabetes mellitus.

Non-alcoholic fatty liver disease

Excess deposition of fat could lead to inflammatory changes in the liver, resulting in non-alcoholic steato-hepatitis (NASH). The gold standard in making the diagnosis is liver biopsy, which may not be practical. Hence a presumed diagnosis of NASH may be made based on an elevated ALT with ultrasonographic changes of hepatic steatosis, provided that there is no evidence of other liver diseases.

Evaluation of an obese patient

Most cases of obesity are due to excess energy consumption. Children with nutritional obesity will also gain height, so they will be tall obese children. Obesity could also be due to genetic illnesses (such as Down syndrome, Prader-Willi syndrome) or some endocrine disorders. They have faltering height and will be short obese patients.

Once obesity is diagnosed it is important to take a complete dietary and physical activity history. Children above 5 years of age need to be screened for metabolic derangements. After a 12-hour overnight fast it is necessary to measure fasting blood glucose, lipid profile, ALT, and a random blood glucose test.

How to treat?

Treatment is aimed at achieving an appropriate weight for height or appropriate BMI for age, and treating any associated complications. Children are growing, and treatment should not affect their growth. A reasonable initial target would be to maintain weight for at least 1-2 years. As they grow tall their weight will match the height and BMI will reach acceptable levels. At present no medications or surgical techniques are available, and a behaviour modification process needs to be adopted (see panel).

Panel. Management of obesity

Goals of management

- Maintenance or reduction of weight
- Treatment of complications
- Psychological adjustment

Management of obesity

Behaviour modification

- Change in dietary pattern
- Change in activity pattern
  - increase physical activity
  - reduce sedentary activity
- Provide psychological support

Dietary guidelines

Take 5-7 servings of fruits/vegetables a day with a reasonable amount of fibre in the diet. The child should take less refined food, and water should be the drink to relieve thirst. Choose protein containing food low in fat (skinless chicken, grilled meat). Discourage buying meals from outside the home, and discourage parents from stocking unwanted food and drinks at home (biscuits, chocolates, sugary drinks). Advice the child to overcome bad eating habits such as night-time eating, binge eating, emotional eating (stress, boredom), too many snacks, meal skipping, too many liquid calories (eg. sugary drinks), and dining out often.

If the maturity of a boy is Tanner stage 3-4 or above, and of a girl is Tanner 2-3 or above, they will not grow in height very much. Hence restriction of calories and reducing weight are important to bring down the BMI.

Increase physical activity

Children needed to be encouraged to engage in daily physical activity for at least 45-60 minutes, and to participate in sports activities at school. Most obese children will feel fatigue soon after physical exercise, as cooling of their body is impaired due to thick subcutaneous fat. It may be necessary to engage in physical activity for about 10-15 minutes, have a 5-10 minute break, and restart physical activity. Cycling, running, jogging and swimming are recommended physical activities.

Reduction in sedentary behaviour

Children should be advised to reduce the time spent on tuition, watching TV, and playing video/computer games.

Medical practitioners should pay attention to the nutritional status of children under their care. Detecting overweight and obesity early and treating them will help prevent many adult non-communicable diseases.

Suggested reading

1. Wickramasinghe VP, Lamabadusuriya SP, Atapattu N, Sathyadas G, Kuruparananthan S, Karunarathne P. Nutritional status of schoolchildren in an urban area of Sri Lanka. *The Ceylon Medical Journal* 2004; **49**: 114-8.

2. Obesity; preventing and managing the global epidemic. WHO Technical Report Series 894, WHO Geneva. 2000.

3. Zimmet P, Alberti KGMM, Kaufman F, Tajima N, Silink M, Arslanian S. The metabolic syndrome in children and adolescents – an IDF consensus report. *Pediatric Diabetes* 2007; **8**: 299-306.

4. Alberti, KGMM, Zimmet P, Shaw J. Metabolic syndrome: a new worldwide definition. A consensus statement from the international diabetes federation. *Diabetic Medicine* 2006; **23**: 469-80.

Dr. Pujitha Wickramasighe, MBBS, MD (Paed), DCH, *Senior Lecturer in Paediatrics, University of Colombo.*

E-mail: <pujithaw@yahoo.com>

Conflicts of interest: none declared.

Management of haemorrhoids

Symptomatic anal vascular cushions are called haemorrhoids. It's a common condition encountered in general practice. The most striking feature is passage of fresh blood at defecation. Other features are lumps at anus, discomfort in perianal region and pruritus ani. None of these symptoms are specific to haemorrhoids. Most patients make the diagnosis of haemorrhoids themselves before seeking medical advice, sometimes leading to delay in diagnosis of other important conditions.

Panel 1. Differential diagnosis of haemorrhoids

Common	Rare
Anal fissure	Solitary rectal ulcer
Perianal fistula	Radiation colitis
Inflammatory bowel disease	Vascular ectasia
Neoplasms in distal bowel	Infective colitis
Diverticular disease	

Evaluation

A comprehensive assessment is required before commencement of treatment. A typical haemorrhoidal bleed produces fresh bright red blood that does not mix with stools. Bleeding occurs before or after defecation. In all patients a digital rectal examination is mandatory. However a proctoscopy is required to see prolapsing anal cushions. Presence of alarm signs makes the endoscopic examination of the colon essential to exclude other pathology.

Panel 2. Alarm signs

- Persistent rectal bleeding for more than six weeks at all ages.
- Rectal bleeding above fifty years.
- Loss of appetite, loss of weight, strong family history (first degree relative) of colorectal cancer.
- Abnormal physical findings (eg. abdominal mass, rectal growth)
- Iron deficiency anaemia without an obvious cause.
- Passage of mucus.
- Incomplete evacuation of stools.

Treatment

The treatment of haemorrhoids is based on the clinical degree and symptoms. Asymptomatic haemorrhoids do not require specific treatment. The following classification of haemmorhoids is useful.

- First degree – internal haemorrhoids that bleed but do not prolapse.
- Second degree – those that prolapse and reduce spontaneously (with or without bleeding)
- Third degree – prolapsed hemorrhoids that require reduction.
- Fourth degree – acutely thrombosed, incarcerated internal hemorrhoids.

Medical therapy

Haemorrhoids with first or second degree prolapse are amenable to medical therapy. It is based on prevention of straining, and constipation, and proper toilet training. Increasing the amount of dietary fibre intake may reduce bleeding and pain. These could be supported with bulk forming laxatives in selected cases. The use of stool softeners has not shown good results. Advice on toilet training, such as timing and avoidance of prolonged straining is important. Topical analgesics may help reduce the pain associated with defecation. Topical hydrocortisone may ease internal haemorrhoidal bleeding. If there is failure of medical therapy, other forms of treatment need to be considered.

Non-resectional therapy

This is chosen in symptomatic first, second degree and selected third degree haemmorhoids. All modalities are outpatient procedures. The therapy is aimed at reduction of the haemorrhoidal volume, reduction of vascularity or fixation of the mass to the rectal wall.

Commonly used measures are rubber band ligation (RBL) and sclerotherapy (ST). These are as equally effective as laser coagulation, infrared coagulation and cryotherapy. RBL is considered the most effective of all outpatient procedures. Up to 80% success rates are reported. Bands are applied to the redundant mucosa proximal to the dentate line. Popular commercially available instruments use suction to drive the redundant tissue into the applicator to make the procedure a one-person effort. Up to three haemorrhoids can be banded. Many authorities prefer to limit treatment to one or two masses in a session. Complication rates are less than 5%. Incidence of pain is slightly higher compared to ST. Extreme caution needs to be exerted when dealing with the anterior haemorrhoidal mass in females as improper application can lead to rectovaginal fistula.

Submucosal injection of 5 ml of 5% phenol in oil at the apex of the haemorrhoidal complex leads to thrombosis of the mass. Pain is reported in about 12%-70% of patients. Impotence, prostatitis, urinary retention and abscess formation though less common, need to be considered in males. Following treatment, patients are advised on the possibility of bleeding, pain and sepsis.

Surgical haemorrhoidectomy

Haemorrhoidectomy has the least rate of recurrence. It carries the highest morbidity compared with other options. Hence it is reserved for patients having refractory symptoms after other treatments as well as those with larger internal or intero-external masses. Haemorrhoidectomy is performed using open or close technique. Most surgeons now prefer using an diathermy dissection instead of sharp instruments.

Stapled haemorrhoidopexy produces similar results to surgery by removing a sleeve of mucosa above the dentate line. This disrupts the vascular pedicle and removes the redundant mucosa. Despite the cost, its popularity is increasing as the pain and bleeding are significantly less. However, long term results are yet to be established.

Thrombosed external haemorrhoids

Options here are emergency haemorrhoidectomy and expectant management. Surgery results in faster relief of symptoms. Most surgeons practice conservative management with analgesics, laxatives and sitz baths. Forty percent of the patients do not require further therapy following conservative management.

Summary

Haemorrhoids are the commonest cause of rectal bleeding. In all age groups high risk patients need to be identified for further evaluation with endoscopy. The nature of intervention is based on the symptoms and clinical degree. Medical therapy, non-resectional therapy and surgical haemorrhoidectomy are decided on the severity of symptoms.

Suggested reading

1. Madoff RD, Fleshman JW. American Gastroenterological Association technical review on the diagnosis and treatment of hemorrhoids. *Gastroenterology* 2004; **126**:1463-73.
2. Davila RE, Rajan E. ASGE Guidelines: the role of endoscopy in the patient with lower-GI bleeding. *Gastrointestinal Endoscopy* 2005; **62**: 656-60.

Dr. Deepaka Weerasekera, MBBS, MS, FRCS, *Senior Lecturer, Department of Surgery, University of Sri Jayewardenepura* and **Dr. Rohan Siriwardana,** MBBS, MS, *Senior Registrar in Gastroenterology, University Surgical Unit, North Colombo Teaching Hospital.* E-mail: <rohansiriwardana@yahoo.com>

Conflicts of interest: none declared.

Prescribing good oral hygiene for adults

Summary

Good oral hygiene is necessary to maintain a healthy mouth. This involves effective, mechanical removal of bacterial plaque from the teeth and from between the teeth every day. Patients need information and instruction about tooth brushing, flossing and interdental brushing for optimal self-care of the teeth and gums.Teeth should be brushed twice a day, with once-daily cleaning of the interdental spaces with floss or an interdental brush.

Key words: dental plaque, periodontal disease, toothbrushing.

(Aust Prescr 2009,32:72-5)

Introduction

Periodontal disease and dental caries are caused by oral bacteria which form biofilms, called 'dental plaque', on the surfaces of teeth. Good oral hygiene describes procedures which mechanically disrupt and remove dental plaque from the tooth surface in order to maintain a healthy dentition and periodontium. Since plaque is constantly forming, it needs to be removed every day by brushing and by the use of interdental cleaning aids such as dental floss or interdental brushes. Professional evaluation of dental health is required since self-performed oral hygiene alone is insufficient to treat the more severe form of periodontal disease – chronic periodontitis.

The dental plaque biofilm

The mouth has a diverse resident flora and over 700 different species of oral bacteria have been identified. The majority of these bacteria live in biofilms on the oral mucosa, gingiva and tooth surfaces. Desquamation of mucosa) and gingival surface cells provides a mechanism for constant shedding of attached bacteria back into saliva and clearance by swallowing. However, biofilms which form on non-shedding surfaces such as teeth are not washed away by the action of saliva or by rinsing with fluids.

Biofilms are complex structures of bacterial communities adhering to surfaces in aqueous environments. The bacteria are surrounded by an extracellular polysaccharide and protein matrix. This protects them by restricting diffusion of host antimicrobial factors, antiseptics and antibiotics[1], or by inactivating these agents within the biofilm. Dental plaque biofilms can only be removed from the tooth surface by mechanical means and therefore mechanical procedures are the mainstay of good oral hygiene.

Plaque formation

Following thorough cleaning of the tooth surface, bacteria from saliva begin re-attaching within minutes. It takes approximately 24-48 hours for sufficient plaque to form and be visible as macroscopic, milky-white, soft deposits on the tooth surface (Fig. 1). Plaque is a soft deposit so it can be easily removed with toothbrushes and interdental cleaning aids. However, when plaque becomes mineralised (calculus), it requires scaling for removal.

Fig. 1 **Dental Plaque**

Deposits of bacterial plaque on the teeth are white in colour, but can be visualised with plaque disclosing rinses. Plaque forms quickly near the gum margin.

What is the best type of toothbrush?

Toothbrushes with soft bristles are recommended for effective plaque removal.They are able to splay beneath the edge of the gingival margin to remove plaque from the tooth surfaces in the crevice between tooth and gum. Hard bristle brushes should be avoided as these do not improve the efficiency of plaque removal and they can damage the gingival tissues and cause gum recession. They can also cause defects by abrading the tooth surface. Although manual toothbrushes can be purchased with soft, medium or hard bristles, all powered toothbrushes have only soft bristles. The head of the toothbrush should be small enough to allow access to all areas of the dentition, particularly the posterior teeth (Fig. 2). Most people do not clean the inner surfaces of the lower teeth effectively. A toothbrush with a small head helps in accessing these surfaces while the handle size and shape should suit the user's dexterity.

Fig. 2 **Toothbrushes**

Manual brushes with small heads and soft bristles, and rotation-oscillation type powered brushes are effective designs to remove plaque.

Are powered toothbrushes better than manual ones?

Powered brushes with a rotation oscillation action are the only type with adequate evidence of greater efficacy.[2] Compared with manual brushes, this type of powered toothbrush showed modest improvements in reducing plaque and gingival inflammation scores and was considered to be 'at least as effective' as manual brushes. Brushing for two minutes is the optimal duration necessary to achieve adequate plaque removal. A major advantage of powered toothbrushes is that individuals brush for longer with them as compared with manual brushing.[3] Powered toothbrushes are helpful for individuals with dexterity or disability problems and for carers of the elderly and infirm.

How often should toothbrushes be replaced?

Toothbrush manufacturers recommend replacement every three months. Both manual and powered brushes which are three months old are still as effective as new

brushes in plaque removal[4,5] so toothbrush wear does not impede plaque control.

What is the most effective technique of toothbrushing?

No one technique has been shown to be consistently more effective than another. A recommended technique for manual brushes is to place the bristles at a 45° angle to the tooth surface at the gum edge and then move the bristles back and forth in short (tooth-wide) strokes or small circular movements. The tip of the brush is used in an up-and-down manner to clean the inner surfaces of the front teeth.[6] Powered toothbrushes should be held against the tooth surface so that the bristles splay into the crevice between the gum and the tooth. Since the bristles are already moving, there is no need for back and forth actions. Instead, the bristles are held against each tooth in turn in a systematic fashion ensuring that all outer, inner and chewing surfaces are brushed. When using a powered toothbrush, a low brushing force is more effective than a high force in plaque removal.

Is brushing with toothpaste necessary?

Brushing with toothpaste does not remove more plaque than brushing without paste.[7] However, toothpastes and gels are excellent vehicles for delivering fluoride to tooth surfaces to prevent dental caries, as well as delivering other agents to promote re-mineralisation or reduce sensitivity of tooth surfaces. Detergents and other additives in toothpaste may slow the rate of plaque formation. Although toothpastes can remove stains caused by tobacco or beverages, abrasive toothpastes can be harmful as they can cause tooth abrasion.

Is massaging of the gums required during brushing?

Massaging the gums does not resolve or prevent gum disease. This concept dates from an era before the causative role of dental plaque in periodontal disease had been identified and when it was thought that gingival tissues needed to be 'hardened' by physical stimulation to prevent absorption of 'toxins'. Periodontal disease is caused by plaque on the teeth and brushing the gums to 'massage' them does not remove this plaque, but can damage the gums and cause recession.

Does brushing clean between the teeth?

The interdental area is the site of rapid plaque development and the most common site for the onset of periodontal disease. It is also a common site for dental caries. Dental plaque cannot be effectively removed from this area with either a powered or a manual toothbrush since the ends of toothbrush bristles do not reach the tooth surfaces beneath the contact points of teeth. Dental flossing plus brushing removes more plaque from between teeth than brushing alone.[8]

How should flossing be performed?

Flossing is not merely about removing food from between the teeth. The aim is to 'wipe' the interdental tooth surfaces with floss or tape to mechanically dislodge the plaque biofilm. This is particularly important within the crevice between the gum and tooth between adjacent teeth. An effective technique[6] involves gently moving floss through the contact area between the teeth with a back and forth action, ensuring that the floss does not suddenly slip through in an uncontrolled fashion and traumatise the top of the gum. The floss is then shaped into a C configuration so that it 'hugs' one proximal tooth surface and is then moved from the contact area to a position under the edge of the gum where it cannot penetrate any further and then back again to the contact area (Fig. 3). This up and down wiping action should be repeated several times and then the tooth surface on the other side of the interdental space cleaned in the same way.

Flossing can be a difficult exercise to master initially, and coaching and motivation are required. Studies have shown that floss-holding devices as well as various automated flossing devices are as effective as manual flossing and that patients often prefer these to manual flossing.These devices require only one hand for operation and are available with various handle configurations. They are often helpful for those with dexterity or disability problems or for carers responsible for the oral hygiene of the elderly and infirm.

Are there alternatives to flossing?

Although interdental woodsticks are effective for removing food particles, they are less effective than dental floss for interdental plaque removal. In contrast, interdental brushes are effective in plaque removal. These are spiral brushes that can be pushed forwards and backwards through an interdental space below the contact point of the teeth. The tips of the bristles then mechanically dislodge plaque from the proximal tooth surfaces (Fig. 4).

A randomised blinded crossover trial found interdental brushes to be more effective than floss in removing plaque from accessible interdental spaces.[8] A three-month trial found that interdental brushes reduced plaque and gingival inflammation more than floss and that people became proficient in their use more quickly than with floss.[9] Water jets and other irrigation devices cannot remove plaque from between teeth since the biofilm structure of plaque prevents it being washed off the tooth surface.

Fig. 3 **Dental tape**

Dental floss or dental tape is required for removing plaque from interdental tooth surfaces.

Fig. 4 **Interdental brushes**

Interdental brushes are effective for removing plaque from between teeth.

How often should oral hygiene be performed?

There is little scientific evidence regarding the optimal frequency of oral hygiene procedures. Although thorough removal of plaque once every 48 hours has been shown to preserve gingival health in a dentally aware group, most people only reduce their plaque scores by 50-60% when they brush. It is therefore recommended that the teeth be brushed twice per day and interdental cleaning be performed once per day.[10] Patients who are susceptible to periodontal disease and those with extensive treatment histories require regular professional evaluation and maintenance care.

Specialised oral hygiene

Patients with dental implants, bridges, crowns which are joined together or those with orthodontic brackets and wires on the teeth will require specialised instruction in how best to perform plaque control. Use of special floss with a firm tip at one end or use of floss threaders is required for flossing under bridges, joined crowns and between teeth with orthodontic wires. Interdental brushes are also helpful in these situations. Plaque also forms on denture surfaces and therefore dentures need to be brushed to remove plaque.

References

1. Stewart PS, Costerton JW. Antibiotic resistance of bacteria in biofilms. Lancet 2001;358:135-8.
2. Robinson PG, Deacon SA, Deery C, Heanue M, Walmsley AD, Worthington HV, et al. Manual versus powered toothbrushing for oral health. Cochrane Database of Systematic Reviews 2005, Issue 2. Art. No.: CD002281. DOI: 10.1002/14651858.CDO02281.pub2.
3. Dentino AR, Derderian G, Wolf M, Cugini M, Johnson R, Van Swol RL, et al. Six-month comparison of powered versus manual toothbrushing for safety and efficacy in the absence of professional instruction in mechanical plaque control. J Periodontol 2002:73:770-8.
4. Tan E, Daly C. Comparison of new and 3-month-old toothbrushes in plaque removal, J Clin Periodontol 2002;29:645-50.
5. Hogan LM, Daly CG Curtis BH. Comparison of new and 3-month-old brush heads in the removal of plaque using a powered toothbrush. J Clin Periodontol 2007; 34:130-6.
6. American Dental Association. Oral health topics A–Z. Cleaning your teeth and gums (oral hygiene). 2008. www.ada.org/public/topics/cleaning-faq.asp#4 [cited 2009 May 5].
7. Paraskevas S,Timmerman MF, van derVelden U, van der Weijden GA. Additional effect of dentrifices on the instant efficacy of toothbrushing. J Periodontol 2006;77:1522-7.
8. Kiger RD, Nylund K, Feller RP. A comparison of proximal plaque removal using floss and interdental brushes. J Clin Periodontol 1991;18:681-4.
9. Jackson MA, Kellet M, Worthington HV, Clerehugh V. Comparison of interdental cleaning methods: a randomized controlled trial. J Periodontol 2006; 77:1421-9.
10. Kinane D.The role of interdental cleaning in effective plaque control: need for interdental cleaning in primary and secondary prevention. In: Lang NP, Attstrom R, Loe H, editors. Proceedings of the European workshop on mechanical plaque control. Chicago: Quintessence; 1999. p. 156-68.

Conflict of interest: none declared

Christopher G Daly, *Discipline of Periodontics, Faculty of Dentistry, University of Sydney.*

This article is reproduced from the *Australian Prescriber Volume 2*, by prior arrangement.