

All About Anorexia in The Elderly

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ABSTRACT

A complaint of unwillingness to eat in the elderly is often overlooked, both by the patient, the family, or the doctor. Such condition may have a more serious underlying background, such as infection. A reduced physiological deposit and different clinical manifestations gives importance to the analysis of the problem of anorexia. Changes in body composition, reduced physical activity and basal metabolism rate, reduced Na⁺-K⁺-ATP-ase, teeth that are no longer in optimal condition, reduced taste and smell ability, increased CCK satiation effect, reduced gastric emptying, reduced NO-synthase activity of the gastric fundus, as well as reduced endogenous opioid level, could all influence the development of anorexia. In addition, there are also several other clinical conditions that play a role, such as polypharmacy, dementia, depression, and physiological disturbance in swallowing.

Keywords: Anorexia, elderly.

INTRODUCTION

Food intake in the elderly often becomes a problem among out-patients and particularly among in-patients. The problems that could be caused by a low food intake could be well understood, but there is still the argument on what causes the low food intake. Anorexia as a cause turns out to have various unexplored aspects associated with it. This paper intends to briefly discuss these aspects. The understanding that elderly patients should receive comprehensive assessment is another aspect that should maintained.

EPIDEMIOLOGY

Various nutritional problems (malnutrition, poor nutrition, hypoalbuminemia and anemia) make up 28.8% out of all geriatric patients admitted to the Geriatric Acute Inpatient Ward of Cipto Mangunkusumo General Hospital in the year 2001. Patients with a primary diagnosis of pneumonia (61.6%) and (11.6%) are admitted to the inpatient ward through the emergency unit or the outpatient unit with various chief complaints, 27.4% of which due to inadequate food intake.

Feeding difficulty in the elderly are often easily dismissed by the family and health professionals at the first encounter. This is greatly detrimental for patients since their nutritional status would deteriorate in a short period of time and it becomes difficult for physicians to assist the patient in regaining a satisfactory nutritional status due to a limited physiological deposit.^{1,2,3}

Appetite Control

Appetite control or regulation is a complex process involving a central as well as a peripheral mechanism. Various neurotransmitters play an important role in this regulation; at the central level, the neurotransmitter works at the paraventricular and the ventromedial nuclei of the hypothalamus, as well as nuclei located near the fourth ventricle.⁴

The neurotransmitters that play a role in increasing food intake are endogenous opioids, which are particularly associated with K receptors in the brain; galanine (a peptide) that also plays a role in increasing intake; the two more associated with fatty intake. Other neurotransmitters that also function to stimulate a person to eat are the Y-neuropeptide, norepinephrine (that stimulates gamma amino butyrate acid receptors) as well as melanin-concentrating hormone (MCH), all three of which play a role on carbohydrate intake. Increased nitric oxide synthase (NO-synthase) activity can also increase the stimuli to eat through a certain mechanism in the central nervous system.^{4,5}

Neurotransmitters that inhibit food appetite include the corticotrophin releasing factor, 5-hydroxytryptamin

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(serotonine), and isatine. Corticotrophin releasing factor is the strongest anorexygenic factor. Patients with anorexia nervosa have a hyperactive hypothalamus-hypophyseal-adrenal axis, and patients with depression have increased hypophyseal-adrenal axis activity. Two other anorexygenic factors inhibit food appetite through a central mechanism.

The mechanism that regulates the stimuli to eat at the periphery is particularly controled by hormones produced by the gastrointestinal tract. These hormones are peptides that are released as a response towards food intake. A hormone that has largely been studied is cholecystokinine (CCK); this hormone is released when food is ingested (particularly fats and proteins), activating type A CCK receptor at the gastric pilorus. Nerve impulse would then be relayed through the vagal afferent nerve fibers into the nucleus tractus solitarius and hypothalamus so that the person feels satiated and stops eating.^{5,6}

Fat tissue also plays an important role in food regulation. The body fat deposit produces satiety and adipisin that provides feedback to the central nervous system to a person from eating. Zhang et al (1994) as quoted by Hosam (2000) cloned mice fat cells and found an obese gene in mice that could secrete leptin. Leptin substance is revealed to have an inhibitory effect on Y-neuropeptide release at the hypothalamus.^{4,7}

The sex hormones also play a role in appetite increase or reduction. Testosterone increases appetite. As testosterone levels decrease with age, it also increases plasma leptin levels, thus reducing appetite.⁸

Several illnesses such as rheumatoid arthritis, malignancy and AIDS release cytokine (IL-1 and alpha-TNF) that reduces appetite. Glucose intake stimulates Langerhan's cells to release amylin, which reduces appetite.

Increased nitric oxide synthase activity causes fundal relaxation, thus increasing food intake.^{4,6,7,8}

This regulatory mechanism is schematically portrayed in the following diagram.

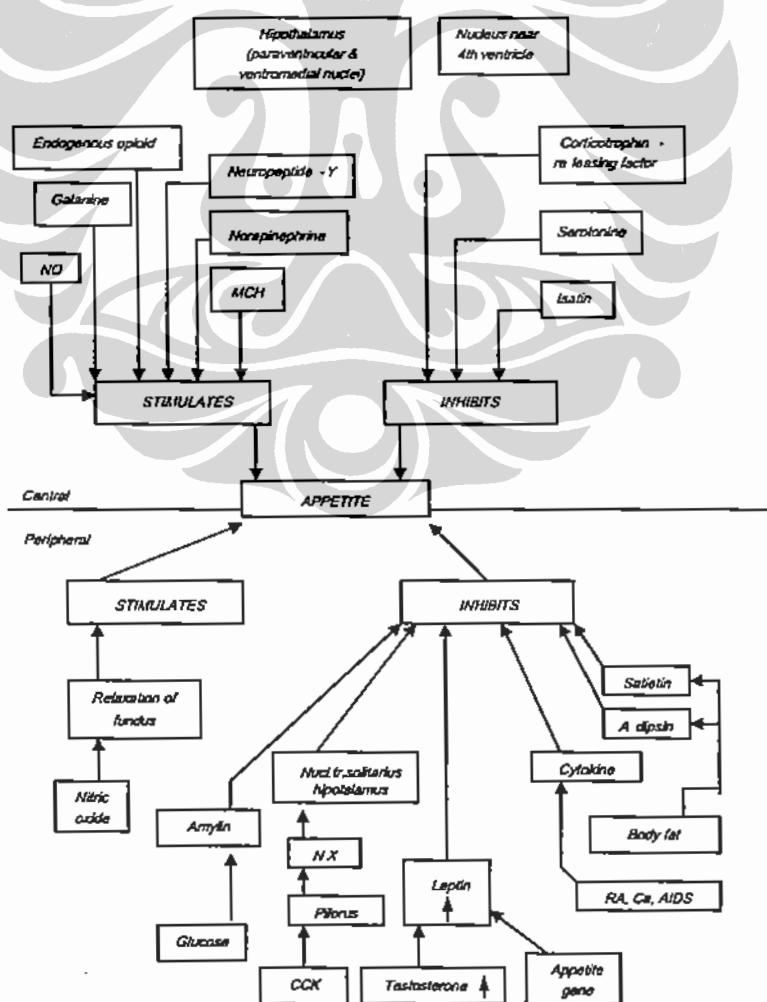


Figure 1.

THE PHYSIOLOGY OF ANOREXIA

A reduced food intake in the elderly may be physiological caused by several things. Changes in body composition (loss of muscle mass) causes a reduced lean body mass along with an age-related reduction in calorie requirement. Along with this, physical activity is also reduced. A smaller lean body mass causes a reduced basal resting metabolism rate that in turn also reduces energy/food intake.^{9,10}

Such reduction in basal metabolism rate in the elderly may also be caused by reduced Na⁺-K⁺-ATPase activity and a slight reduction in triiodothyronine.

Reduced food intake due to anorexia may also be caused by teeth and gums that are no longer in optimal condition, reduced taste and nose buds, reduced endogenous opioids, the satiation effect of increased CCK, a slower rate of gastric emptying, and a reduction in fundal nitric oxide synthase activity.^{9,11}

Clinically, inadequate carbohydrate and protein intake could cause marasmus, kwashiorkor or a combination of both. These extreme conditions are now rare, but progression towards such conditions is still common. Marasmus is associated with long term insufficient intake of carbohydrate (years or months). Skin fat becomes very thin and finally protein (muscle) catabolism ensues. Albumin levels are usually not too low, except in highly advanced stages.

If the condition of insufficient carbohydrate intake (starvation) continues or is accompanied by physical stressors (infection, surgery, trauma, burns), hypoalbuminemia and kwashiorkor occurs. Conditions of marasmus-kwashiorkor in the elderly is often called the senile rusting syndrome, which tends to progress to sarcopenia and failure to thrive.^{2,5}

Causes of Anorexia

There are various factors that cause anorexia, which for practical purposes could be classified as social, psychological, and medical causes. Poverty is the most common social cause, along with it, there is usually limited access to shopping centers and a lack of adequate transportation facilities (the public buses in Jakarta do not allow a 75-year old or 80-year old to get on by him/herself to buy groceries). Take note that doctors often prescribe drugs that are too expensive, forcing geriatric patients to allocate their grocery money for medications, causing them to have limited funds to purchase groceries.

Another social cause that is starting to become more common in Indonesia is elderly abuse. From 2001 to May 2003, records show eight geriatric patients from various

classes who have been abused by family members. Their funds were discreetly taken from them and they became financially distraught and unable to continue treatment or live properly.

The most common psychological cause of anorexia is depression or adaptation disturbance with a depression affect. Depression among young adults rarely influence food intake, but it is not the case among the elderly. Such condition almost always reduces food intake, sometimes even to the point of a passive suicide attempt.^{3,5}

Dementia or reduced cognitive function also causes elderly patients to become more forgetful, even forgetting whether they have or have not eaten. Swallowing apraxia, dementia drugs, wandering, and paranoid ideas (that their food is being poisoned) often cause low food intake among dementia patients. Swallowing apraxia refers to the condition where patients need to be reminded to swallow after chewing their meal.^{3,12}

Anorexia nervosa could also occur among elderly patients, and is considered as a recurrence of anorexia during young adulthood. Nevertheless, anorexia could first appear during old age, and is known as tardive anorexia.⁶

Medial conditions such as malignancy, chronic obstructive pulmonary disease, heart failure, malabsorption, rheumatoid arthritis, and poly-pharmacy, could also cause anorexia. Malignancy and rheumatoid arthritis causes increased cytokine that influences appetite. COPD often causes aerophagia and increased use of accessory respiratory muscles, reducing food intake and nutritional status. Drugs that are used in COPD and heart failure also often cause dyspepsia and disturbs food intake. The use of multiple drugs due to multiple pathology certainly increases the possibility of dyspepsia, resulting in a reduced food intake. Drugs that are used include: digoxin, teophyllin, fluoxetine, NSAID, and iron supplementation.^{8,13,14,15}

The following acronym may be used as a mnemonic device "*Kurang Makan*" (Inadequate food intake) or "Poor In(n)take" to explore possible causes of anorexia among elderly patients:

- K** onsumsi banyak obat? (many Kinds of drugs)
- U** ang tak cukup /miskin? (Unable to buy/inadequate funds/poverty)
- R** endah garam, rendah lemak? (diet terlalu ketat ?) (Rigorous diet - low salt, low fat)
- A** noreksi akibat infeksi? (Anorexia due to infection)

- N eoplasma? (Neoplasm)
 G igit-geligi dan higiene mulut buruk? (Gums and teeth hygiene – poor)
 M enelan ada gangguan? (many Kinds of drugs)
 A bsorpsi terganggu ? (Absorption problems)
 K ehilangan seseorang? (Keen on someone they have lost)
 A MT (abbreviated mental test) menurun? (Abbreviated Mental Test score reduction)
 N eglacted ? (Neglected)

or

- P oly pharmacy
 O nly little money
 O ral and dental hygiene problems
 R igrorous diet – low salt, low fat
 I nfection
 N eoplasm
 (N) eglacted
 T oo hard to swallow
 A MT score reduction
 K een on someone they have lost
 E ating but not absorbing properly

DISCUSSION^{16,17,18}

Anthropometric measurements to determine body mass index could be used to determine nutritional status. Attention needs to be paid when determining body height that is usually reduced with age. Weight loss should also be inquired to screen reduced nutritional status. Attention needs to be paid when determining body height that is usually reduced with age. Weight loss should also be inquired to screen reduced nutritional status. Cognitive and psycho-affective states also need to be assessed, since they have a great influence on food intake.

During the physical examination, paresis of the muscles used to swallow as well as oral and dental hygiene. Difficulty swallowing and uncomfortable oral and dental conditions often reduce appetite. Nutritional history and the patient's access to food should be assessed to obtain a more detailed picture.

Important supporting examinations are albumin, hemoglobin, and plasma cholesterol levels.

After a complete picture of the geriatric patient's nutritional status and influencing factors is obtained, it should not be too difficult to take further measures.

The nutritional program should be administered according to current findings. The type and amount of

nutrition should be adjusted to the patient's existing condition. Changes in the type and amount of nutrient should take place gradually and food intake should be more carefully evaluated.

CONCLUSION

The factors that play a role in determining an elderly person's appetite and physiological causes of anorexia in the elderly have been discussed. Several diseases often influence a person's nutritional status; these causes usually can be controlled as long as they are identified as early as possible. Understanding of the physiology of appetite and anorexia greatly determine the assessment process of geriatric patients, particularly those associated with issues of nutritional intake.

Further management depends on existing findings and the patient's overall condition. More careful and continuous intake evaluation should be undertaken, noting that the clinical change that takes place among geriatric patients is often different to what was originally predicted.

REFERENCES

1. Soejono CZ H. Suplementasi vitamin dan mineral pada pasien geriatri, apa manfaatnya?. Jakarta: KPPIK FKUI, 2003.
2. Rumawas JSP. Pentingnya gizi bagi lansia sehat. Makalah. Lokakarya nutrisi pada geriatri, bag. ilmu penyakit dalam FKUI / RSCM. Jakarta. 28 Nov 1994 : lampiran 1.
3. Dror Y, Berner YN, Stern F, Polyak Z. Dictary intake analysis in institutionalized elderly: a focus on nutrient density. *J Nutr Health Aging* 2002;6(4):237-42.
4. Hosam KK, Morley JE. Anorexia of ageing. In: Evans JG, Williams TF, Beattie BL, Michel J-P, Wilcock GK, editors. *Oxford textbook of geriatric medicine*. 2nd ed. Oxford: Oxford university press; 2000. p.158-61.
5. Roberts SB. Impaired regulation of energy intake in old age. In: Rosenberg IH, Sastre A, editors. *Nutrition and aging*. Switzerland: Karger-basel-nestec Ltd.; 2002. p.49-58.
6. Salzman JR, Russell RM. Gastrointestinal function and aging. In: J E Morley, Z Glick, L Z Rubinstein, editors. *Geriatric nutrition, a comprehensive review*. 2nd ed. New York: Raven Press Ltd.;1995. p. 186-7.
7. Hall K E, Wiley J W. Age-associated changes in gastrointestinal function. In: Hazzard WR, Blass JP, Ettinger WH, Halter JB, Ouslander JG, editors. *Principles of geriatric medicine and gerontology*. 4th ed. New York: McGraw-hill companies, Inc.;1999 . p. 838.
8. Fleming DJ, Jacques PF, Dallal GE, Tucker KL, Wilson PWF, Wood RJ. Dictary determinants of iron stores in a free-living elderly population: the framingham heart study. *Am J Clin Nutr* 1998;67:722.
9. Kehayias JJ. Aging and body composition. In: Rosenberg IH, Sastre A, editors. *Nutrition and aging*. Switzerland: Karger-basel-nestec Ltd.; 2002. p.63-73.

10. Baylink DJ, Jennings JC, Mohan S. Calcium and bone homeostasis and changes with aging. In: Hazzard WR, Blass JP, Ettinger WH, Halter JB, Ouslander JG, editors. *Principles of geriatric medicine and gerontology*. 4th ed. New York: McGraw-hill companies, Inc.; 1999. p. 1042-4.
11. Sedmihradsky J. Good prospects for the aging gastrointestinal system: normal function is retained despite age-related changes. *Geriatrics and aging* 2000;3(2):1-4.
12. Johnson KA, Bernard MA, Fundenburg K. Vitamin nutrition in older adults. *Clin Geriatr Med* 2002 Nov;18(4):773-9.
13. Bidlack WR, Wang W. Nutrition requirement of the elderly. In: Morley JE, Glick Z, Rubenstein LZ, editors. *Geriatric nutrition: a comprehensive review*. 2nd ed. New York: Raven press Ltd.; 1995. p. 40.
14. Dror Y, *et al*. Recommended micronutrient supplementation for institutionalized elderly. *J Nutr Health Aging* 2002;6(5):295-300.
15. Shankar AH, Prasad AS. Zinc and immune function: the biological basis of altered resistance to infection. *Am J Clin Nutr* 1998;68:447S-49S.
16. Prakoso MID. Penatalaksanaan dietetik pada pasien geriatri di RSCM. Makalah. Lokakarya nutrisi pada geriatri, bag. ilmu penyakit dalam FKUI/RSCM. Jakarta. 28 Nov 1994 : lampiran 5.
17. Guigoz Y. Recommended dietary allowances (RDA) for the free living elderly. In: VellasBJ, Guigoz Y, Garry PJ, Albarede JL, editors. *The mini nutritional assessment: MNA*. 3rd ed. Paris: Serdi publishing Co.;1997 . p.128.
18. Muhilal, Jus'at I, Husaini, Jalal F. Angka kecukupan gizi yang dianjurkan. In: *Widyakarya nasional pangan dan gizi VI*. Jakarta: Lembaga Ilmu Pengetahuan Indonesia; 1998 . p. 877.

