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Small intestinal disorders in the elderly

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A B S T R A C T

The topic of gastroenterology (GI) in the elderly has been extensively reviewed. It takes special skill, patience and insight to interview the elderly, as well as to appreciate their altered physiology and interpretation of their presenting symptoms and signs, often against an extreme background of complex medical problems. The maldigestion and malabsorption coupled with altered motility contributes to the development of malnutriton. There generally a decrease of function of the GI tract, but there may be loss of adaptability in response to changes in diet or nutritional stress. Pathological alterations which might lead to minor overall intestinal functional variations in the young because of a normal process of adaptation, may lead to much more serious events in the elderly.

Introduction

The topic of gastroenterology (GI) in the elderly has been extensively reviewed and is updated here [1]. The definitions and postulated mechanisms of ageing are provided in Tables 1 and 2 [2,3]. It takes special skill, patience and insight to interview the elderly, as well as to appreciate their altered physiology and interpretation of their presenting symptoms and signs, often against an extreme background of complex medical problems. Disorders of the GI tract are both common and distressful at any age, let alone in the elderly. Indeed, "…many, if not the majority, of the digestive complaints [of the elderly] are of a functional ('physiological') origin without dependable organic basis", are related to the adverse effects of mediation, dysmotility or secretory disturbance [3].

Poor intestinal status has a major negative effect on the well being of the elderly, with involuntary weight loss occurring in about one in five. A number of the physiological changes that occur in the GI tract with ageing are listed in Table 3.

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Table 1
Definitions of aging.

- Chronological age
  - Passage of time from birth onwards
  - Easy to measure
  - Increased age-specific mortality rates
  - Variable cut-off for 'old' determined by unemployment rates
- Biological age
  - Presence or absence of physical disease, functional or cognitive impairment
  - Increased incidence of chronic disease in late life
  - Presence of age-associated conditions
  - Better marker of health status than chronological age
- Successful ageing
  - Variability in the ageing process
  - Old age presents the opportunity for positive change, new developments
  - Medical model - compression of morbidity, absence of physical illness and functional impairment
  - Social model - ability to adapt to changes in society to maintain role and status
  - Psychological model - maintenance of mental competence and well being

Reproduced with permission from Balcombe N and Sinclair A. Chapter 1, Ageing: definitions, mechanisms and the magnitude of the problem. Best Practice and Research Clinical Gastroenterology 2001;15(6):835–49 [5].

Malnutrition is also common in the elderly, and is often related to poor food choices, perhaps because of socioeconomic depravation, poor dentition, loss of appetite, depression, chronic alcoholism, atrophic gastritis, previous gastric surgery, and drug interaction [4]. The maldigestion and malabsorption (together, they called "malassimilation"), coupled with altered motility (which occurs as part of the loss of small intestinal function which normally is seen even in those elders without associated disease), contributes to the development of malnutriton [5]. Not only is there generally a decrease of function of the GI tract, but there may be loss of adaptability in response to changes in diet or nutritional stress. Pathological alterations which might lead to minor overall intestinal functional variations in the young because of a normal process of adaptation, may lead to much more serious events in the elderly.

Metabolism

Drugs are commonly used in the elderly (polypharmacy) to treat associated co-morbidities, and these may cause diarrhoea by several different processes (Table 4).

Necrotizing enterocolitis (NEC) is a major inflammatory disease of the premature human intestine. If glucocorticosteriods are given prenatally before the 34th week of gestation, NEC may be prevented. In human intestinal xenografts, cortisone acetate accelerates the ontogeny of lactase in the 20 week immature tissue, but the effect is lost by 30 weeks (mature). With the accelerated maturation achieved with glucocorticosteroids, the IL-8 response to IL-1 beta and to lipopolysaccharide is reduced in the immature but not in the mature xenografts [6]. These authors suggest that quote "… accelerating intestinal maturation by glucocorticoids within the responsive period by accelerating functional and inflammatory maturation may provide an effective preventive therapy for NEC".

Proliferation: morphology and brush border membrane

Phospholipase A2 (PLA2) and the Ca2+-independent PLA2 (iPLA2) enterocytes potentiate the parathyroid hormone (PTH)-induced arachidonic acid (AA) release in ageing cells. The substantial increase in PTH-induced AA release with ageing may potentially alter intestinal brush border membrane (BBM) fluidity, permeability, and/or function. Ageing causes an increase in gut epithelial apoptosis, and this may be increased further in septic mice [7]. The combination of ageing and sepsis increases cell death in the intestine and thereby may possibly play a role in the marked increase in