

Review Article

Malnutrition in elderly and its relation to depression

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ABSTRACT

The notable increase in number of individuals reaching advancing ages over the past decades resulted in the emergence of various physical and mental disorders that necessitate intervention. Two of the major illnesses encountered at this age group include depression and malnutrition. Depression and malnutrition are prevalent among geriatric population and seem to be strongly associated. The relationship between those two conditions is interactive. Depression leads to appetite and weight changes that results in malnutrition, and poor nutrition predispose old individuals to psychiatric upset (depression, agitation, and irritability). Loss of appetite and weight and major criteria for diagnosis of depression. It is suggested that the neurotransmitters and hormonal changes occurring in depression are responsible for alteration in appetite. On the other hand, dietary supplements are essential for mood regulation. Carbohydrates, proteins, vitamin B, selenium, zinc, lithium, chromium, calcium, and other trace elements are protective against depression. Depression and malnutrition have common risk factors such as loneliness, lack of social support, physical illness, functional impairment, financial paucity, and endocrinal disturbances. There is a vicious circle between depression and malnutrition. Therefore, clinicians should pay attention to both psychological and physical aspects during treating elderly with depression, malnutrition, or both. This article aims to discuss the relationship between depression and malnutrition among geriatric population.

Keywords: Elderly, Malnutrition, Depression

INTRODUCTION

Over the past few decades, there was a notable increase in the proportion of elderly population worldwide. In the United States (U.S.), the percentage of elderly individuals above the age of 65 years increased from 4.1% in 1990 to 8% in 1950 and 12.6% in 2000, and the figure is expected to double over the next decades.¹ Reports from European Statistics anticipate that by 2030, up to 25% of the

population will be above the age of 65 years.² Whilst the growth of elderly population indicates enhanced health care and lower mortality rates, it was associated with the emergence and discovery of various health issues that necessitate intervention. The more the people live to old age, the more the chronic morbidity occurs.

Both physical and mental disorders are prevalent among elderly.³ However, clinicians tend to neglect the mental

disturbance and focus on physical manifestations. Elderly individuals have a powerful mind-body connection and their psychiatric illness may significantly influence their physical health. Depression, in particular, is common in the elderly and can result in loss of appetite, weight, and considerable malnutrition and dehydration.⁴ On the other hand, physical illness and malnutrition may lead to depression in this vulnerable group of population.⁵ Therefore, the treating physicians should pay attention to the strong association between these two conditions. The aim of this article is to explore the correlation between depression and malnutrition and to address the proper management of both conditions.

MALNUTRITION IN ELDERLY

Malnutrition refers to a state of disturbance (either excess or deficiency) of energy intake, protein and other nutrients that results in change in body size, shape, composition, and function.⁶ It is a common but unrecognized disorder in the elderly. Malnutrition affects up to 25% of elderly patients at home and more than 50% of those at rehabilitation institutions.^{7,8} Malnutrition is significantly higher in elderly population even when they have normal body mass index (BMI). This is due to the change of body composition with progressive increase in fat and decline in lean body mass with advancing age.

Malnutrition is multifactorial among this age group. It can be a consequence of physical, mental, mental factors, or a combination of any. It may result from poor dentition, difficulty chewing and swallowing, diminished taste and smell, loss of appetite, difficult mobility and loss of caregivers, loneliness and lack of companionship, dietary deficiencies, polytherapy, side effect of medications, gastrointestinal disturbance, chronic diseases, endocrinal disorders, alcoholism, mental and cognitive changes, malignancies, and depression.⁹⁻¹² Malnutrition is more prevalent in dependent elderly population who have functional impairment. Depression represents an important and reversible cause of malnutrition in old individuals.

In old ages, malnutrition has deleterious adverse impacts on general health. It results in fatigue, increased weakness, diminished activity, exacerbation of existing physical illnesses, and is associated poor prognosis.¹³ Malnutrition is also considered an independent risk factor for morbidity and mortality.¹⁴

DEPRESSION IN ELDERLY

Depression is also common in the elderly and is associated with significant morbidity and mortality.¹⁵ The prevalence of depression in old people ranges from 10-20% depending on the regional, social, and cultural situation.¹⁶ Giving the 4.4% depression rate in adulthood, the elderly individuals are thus two to four times more vulnerable to depression than younger adults.¹⁷ In some studies, the prevalence of depression among the elderly

was as high as 35%. However, those studies included both major and minor depression in the criteria and stated that the minor depression was more common among this age group whereas the major depression was relatively rare.¹⁸

Diagnosis of depression in elderly is performed using the same DSM diagnostic criteria for major depressive episodes in adults. The DSM diagnostic criteria used for adults were proved to be valid and have the same reliability for diagnosing depression in elderly population.¹⁹ Depression is diagnosed one a patient meets - for at least two continuous weeks - five of nine proposed criteria for depression including: depressed mood, loss of interest, appetite changes, significant weight loss, sleep disturbance (either insomnia or hypersomnolence), hypoactivity or agitation, fatigue, suicidal ideations or attempts, sense of guilt, and attention and concentration problems. The patient's symptoms should be significant enough to impair his social function, occupational state, or interpersonal relationships.²⁰

Just like malnutrition, depression constitutes a major burden of diseases in the elderly, and it has negative impacts on patient's function, quality of life, physical illness, and social state. Depression was found to increase the healthcare costs, deteriorate the physical activity, worsen the outcome of medical diseases (e.g. cerebrovascular events, cardiac diseases, hip fractures, and hypertension).²¹ It is associated with increased morbidity and mortality, and increases the risk of late-life suicides.²²

Depression in elderly was found to be more prevalent in females than males. This difference was mainly attributed to the fact that females do report and express their symptoms more readily than males. Factors that increase the risk of depression in geriatric population include low income, lack of social support and companionship, retirement, and chronic medical illnesses.²¹ Diagnosis of depression remains unrecognized and underdiagnosed. This is partly due to the reluctance of old individuals to report their symptoms and partly due to the underestimation of the psychological aspect among many of the clinicians.¹⁶

ASSOCIATION BETWEEN MALNUTRITION AND DEPRESSION IN ELDERLY

There is a strong relationship between the body and mind. In literature, various studies were conducted to explore the relationship between malnutrition and depression. Zamane et al.¹², in their cross-sectional study, reported that 16.4% of older individuals were vulnerable to malnutrition. Other researchers stated that malnutrition was independently associated with depression.²³⁻²⁵ Furthermore, depression leads to loss of appetite, diminution of food intake, and consequently weight loss. Change in the appetite and eating habits is a sign and a

major criterion for diagnosis of depression.^{19,20,26} On the other hand, treatment of depression improves the appetite and nutritional state in the elderly. Similarly, regular eating and healthy nutrition are associated with a better mental and psychiatric performance. In this section, the impact of depression on nutrition and the impact of nutrition on depression will be discussed.

The impact of depression on nutritional status in the elderly

Depression affects the appetite, food intake, and subsequently body weight. The biological and psychopharmacological changes occurring in depression suggests the mechanisms by which appetite is changes. In depression, alteration in neurotransmitters release in cerebral neurons is responsible for the different symptoms encountered in depressed patients. Low levels of serotonin and alteration in dopamine release in the prefrontal cortex, hypothalamic pituitary axis, hippocampi, thalami, and amygdala are responsible for depressed mood, change in appetite and sleep habits, somatic manifestations, and cognitive disturbances in depressed elderly.²⁷

This explains the strong body-mind connection in geriatric population. Depression in old individuals can result in dehydration, malnutrition, and physical illnesses. Furthermore, aging is associated with atrophic inflammation of the gastrointestinal tract particularly the stomach. This leads to malabsorption, decrease in appetite, and consequently malnutrition.⁵

Depression is an independent well-established predictor of nutritional status among elderly and is considered a major cause of weight loss.

The impact of nutrition on psychiatric performance in the elderly

Many physical conditions in the elderly can induce depression, particularly malnutrition. Because elderly individuals are psychologically vulnerable, malnourishment can result in depression among them.

The mechanisms by which malnutrition leads to depression have been extensively studied. As aforementioned, the pathogenesis of major depression includes chemical and biological alterations of neurotransmitter release and function at different areas in the brain and cerebral pathways. Dietary nutrients are the source of essential amino acids, minerals, and trace elements necessary for synthesis of the neurotransmitters involved in the pathogenesis of depression. For instance, tyrosine and phenyl-alanine-containing foods enhance arousal and alertness.²⁸ Dietary supplements containing methionine are essential for production of S-adenosylmethionine, a substance that facilitates the synthesis of neurotransmitters in the central nervous system. Omega-3 fatty acids found in fish oil has a

proved antidepressant effect. Similarly, magnesium and vitamin B (B₁₂ and folate) were found to be involved in the pathophysiology of depression. Although the exact mechanisms behind the involvement of these substances in depression is still unclear, it is suggested that they enhance neural signal transduction through direct action on sodium, potassium, and calcium channels and through modulating the G-proteins and protein Kinase C.²⁹

Carbohydrates were also shown to be related to mood states. Carbohydrate-rich foods enhance mood through stimulating insulin release which delivers glucose to cells increasing body activity and triggering tryptophan release which is essential for neurotransmitters synthesis in the brain. Low-carbohydrate diets, on the other side, is associated with high risk for development of depression.²⁸ Proteins are also essential for protection against depression as they are the source of amino acids required for regulation of mood particularly tyrosine and tryptophan. Tyrosine is essential for synthesis of dopamine and tryptophan is required for production of serotonin, and as aforementioned, both serotonin and dopamine are involved in the pathogenesis and psychopharmacology of depression.^{30,31} Additionally, lithium, iodine, selenium, zinc, calcium, chromium, iron, and other elements are essential to protect the brain against free radicals and subsequently prevent depression.^{28,30}

Therefore, many studies confirmed that better diet quality and health nutrition were associated with better psychological states and lower rates of depression among geriatric population. This included old individuals in various settings including homes, hospitals, outpatients, and institutions indicating that nutritional state is an independent predictor of mental health regardless other confounding factors.^{4,5,23,24} An interesting finding from a study conducted in Hong Kong was that depression was significantly lower in obese elderly in comparison to those with normal weight.³² This ensures the impact of adequate nutrition on psychiatric state among the elderly.

Common risk factors

Along with the biological and molecular explanation for the relationship between malnutrition and depression, it is suggested that they occur concomitantly due to the presence of common risk factors for both conditions. Certain factors are well-established to be associated with high-risk for the development of depression and they are definite etiologies for malnutrition as well. For instance, loneliness and lack of companionship are major risk factors for depression and, at the same time, they can induce depression. Similarly, functional impairment and lack of caregivers result in psychological upset (depression, agitation, and irritability) and difficulty to prepare and get food. Physical illnesses and endocrinal disturbances can also result in loss of appetite and depression. Poor dentition, difficult chewing, and malabsorption can cause weight loss and psychiatric

illness. Financial paucity is another risk factor for depression and malnutrition. Therefore, it is not uncommon to see elderly patients experiencing depression and malnutrition due to the existence of one or more of those risk factors.^{5,6,21–23,33}

Furthermore, some studies indicate a common central etiology for the development of depression and malnutrition. Lesions in certain brain areas, particularly affecting the hypothalamic pituitary axis, can lead to appetite changes, mood changes, and sleep disturbance. Additionally, dietary changes may cause metabolic structural changes in the brain leading to depression.³⁴

Egg-chicken dilemma

Despite the known and well-established associated between depression and malnutrition, the exact relationship between them remains elusive. It is not known whether depression causes or a consequence of malnutrition. There seems to be a vicious circle between them; depression worsens the nutritional status and the poor nutritional condition increases the depression further. The relationship between both conditions is interactive, and further studies are still required to explain the exact association between them. Prospective studies indicated that malnourished elderly develop depression consequently and this is a major predictor of poor outcome and deterioration of the nutrition. Similarly, depressed geriatric populations who have change in appetite and weight as symptoms of depression have worse outcomes, low response to treatment, higher association with physical comorbidities, and consequently less success rates for recovery.^{6–9,13,16,20,22}

The two major factors that mediate the correlation between malnutrition and depression are the appetite and weight loss.³³ Since depression has an evident influence on appetite, it is associated with weight loss and malnutrition. Furthermore, food insecurity and lack of adequate nutrition results in depression. Even when physical, mental, social, cultural, and educational confounding factors were considered, depression and malnutrition were significantly correlated. Because of this strong association between depression and nutrition and well-established connection between the mind the body in geriatric population, it is essential for the clinicians to consider both physical and mental aspects during the treatment process. A multidisciplinary approach including psychiatrists, physicians, psychologists, and nutritionists is a necessity to ensure successful management of the elderly with depression, malnutrition, or both. Providing malnourished elderly patients with psychotherapy, psychiatric care, and antidepressants will improve the nutritional status and fasten management of malnutrition. Similarly, paying attention to the nutritional needs in old patients presenting with depression is fundamental for treating the depression.

CONCLUSION

Depression and malnutrition are prevalent among geriatric population and seem to be strongly associated. The relationship between those two conditions is interactive. Depression leads to appetite and weight changes that results in malnutrition, and poor nutrition predispose old individuals to psychiatric upset (depression, agitation, and irritability). Loss of appetite and weight and major criteria for diagnosis of depression. It is suggested that the neurotransmitters and hormonal changes occurring in depressing are responsible for alteration in appetite. On the other hand, dietary supplements are essential for mood regulation. Carbohydrates, proteins, vitamin B, selenium, zinc, lithium, chromium, calcium, and other trace elements are protective against depression. Depression and malnutrition have common risk factors such as loneliness, lack of social support, physical illness, functional impairment, financial paucity, and endocrinal disturbances. There is a vicious circle between depression and malnutrition. Therefore, clinicians should pay attention to both psychological and physical aspects during treating elderly with depression, malnutrition, or both.

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