Chapter 4

GERIATRIC DEPRESSION: DIAGNOSTIC AND TREATMENT APPROACHES

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INTRODUCTION

Depression, a prevalent and severe mental health disorder, affects individuals across the lifespan, including the elderly population. The incidence rate of depression in the elderly is estimated to range from 5-15%, which may be an underestimation due to the difficulties in accurately diagnosing depression in this demographic and the stigma associated with mental health conditions (1).

Depression in elderly individuals has a substantial effect on their physical and mental well-being, as well as their quality of life. Individuals aged 65 years and above with depression are more susceptible to developing chronic health conditions, including cardiovascular disease and diabetes, and have an elevated risk of becoming disabled, being hospitalized, and requiring institutional care. Depression in the elderly also raises the likelihood of suicide, which is a frequent cause of mortality in this demographic (2).

Depression in older adults is also associated with increased burden on caregivers and healthcare systems. The care of older adults with depression is often complex and requires coordination between multiple healthcare providers, comprising primary care physicians, geriatricians, and mental health specialists (3).

Several factors contribute to the onset of depression in the elderly population, including both biological and psychosocial factors. Some of the recognized risk factors include:

Medical conditions: Chronic illness, disability, and chronic pain are related to increased risk of depression in older adults.

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Life events: Loss of loved ones, retirement, and physical or cognitive decline can all contribute to the evolution of depression in older adults.

Social factors: Social isolation, loneliness, and poverty are also related to increased risk of depression in older adults.

It's important to note that depression in older adults is not a normal part of aging and it is treatable. Early identification, assessment, and management of depression in older adults are essential for improving outcomes and preventing complications (4).

To summarize, depression is a prevalent and serious mental health disorder among the elderly population. Its effects on physical and mental health as well as quality of life are substantial. The accurate identification and appropriate treatment of depression in older adults is critical in order to enhance outcomes and reduce adverse consequences (5).

DIAGNOSING DEPRESSION IN THE ELDERLY

Diagnosing depression in older adults can be challenging due to the unique characteristics of this population. Older adults often present with atypical symptoms of depression, such as physical complaints, cognitive impairment, and apathy, rather than the typical symptoms of sadness, loss of interest, and hopelessness. Additionally, older adults may be less likely to report feelings of sadness or hopelessness, and may be more likely to attribute their symptoms to physical illness or aging (6).

Another challenge in diagnosing depression in older adults is the high rates of comorbidity with other medical and psychiatric conditions. For example, older adults with depression often have other conditions such as heart disease, diabetes, or stroke, which can mimic or mask the symptoms of depression (7).

Despite these challenges, it is important to accurately diagnose depression in older adults in order to provide appropriate treatment and improve outcomes. The best practice for diagnosing depression in older adults includes:

Using a standardized diagnostic tool, such as the Geriatric Depression Scale (GDS) or the Patient Health Questionnaire-9 (PHQ-9)

Conducting a thorough physical and psychological examination

Assessing for comorbid medical and psychiatric conditions

Considering the patient's functional status and ability to carry out activities of daily living

Gathering information from family members or caregivers

It's important to note that depression is often underdiagnosed and undertreated in older adults. Therefore, it is significant to have a high index of suspicion for depression in older adults, especially those with new onset or worsening of symptoms (8).

In addition, it's also necessary to take into consideration the cultural, social and educational backgrounds of older adults, as these factors may influence the way they express their symptoms and how they perceive them (9).

In conclusion, diagnosing depression in older adults can be challenging due to the unique characteristics of this population. The best practice for diagnosing depression in older adults includes using standardized diagnostic tool, conducting a thorough examination, assessing for comorbidities, considering the patient's functional status, and gathering information from family members or caregivers. It's essential to have a high index of suspicion for depression in older adults and to take into consideration the cultural, social, and educational backgrounds of older adults (10).

PHARMACOLOGICAL TREATMENTS FOR GERIATRIC DEPRESSION

Pharmacotherapy plays a crucial role in the treatment of depression in the elderly population. Antidepressant drugs are the most frequently employed treatment option for geriatric depression and have demonstrated efficacy in alleviating depression symptoms in older adults (11).

Selective serotonin reuptake inhibitors (SSRIs) are the most commonly prescribed class of antidepressant medications for geriatric depression. Some examples of SSRIs include fluoxetine , sertraline , and paroxetine. SSRIs have a favorable side effect profile and are generally well-tolerated in older adults (12).

Another class of antidepressants, tricyclic antidepressants (TCAs) such as amitriptyline and nortriptyline, has been traditionally used in older adults but they have several side effects and interactions with other medications, so they are less commonly used (13).

It is noteworthy that the reaction to antidepressant treatment may differ between older and younger adults. Older adults may require lower doses of medication, and may take longer to respond to treatment. Additionally, older adults may be more sensitive to side effects of medication (13).

It's also critical to note that in some cases, geriatric depression may not respond to antidepressant treatment. In these cases, other treatments such as psychotherapy, electroconvulsive therapy (ECT), or transcranial magnetic stimulation (TMS) may be considered (13).

Other treatments, such as omega-3 fatty acids, folate, and S-Adenosylmethionine (SAMe) have been studied as adjunctive treatments for geriatric depression, but there is presently not enough evidence to support their routine use (14).

Furthermore, it is crucial to evaluate and manage any underlying medical conditions that may play a role in the depression and to monitor for potential drug-drug interactions, as older adults are inclined to consume multiple medications (15).

In conclusion, the use of pharmacotherapy is a vital aspect of managing geriatric depression. Selective Serotonin Reuptake Inhibitors (SSRIs) are the most commonly prescribed antidepressant medications for geriatric depression and have demonstrated efficacy in reducing depression symptoms in older adults. However, it's essential to consider that the response to antidepressant therapy in older adults may differ from that in younger adults, and may require lower dosages, a longer response time, and heightened sensitivity to adverse effects. In cases where depression does not respond to antidepressant treatment, other treatments such as psychotherapy, ECT, or TMS may be considered. Other treatments such as omega-3 fatty acids, folate, and SAMe have been studied as adjunctive treatments for geriatric depression, but there is currently not enough evidence to support their routine use. It's also important to address and treat any underlying medical conditions and to monitor for potential drug-drug interactions in older adults (12, 16).

NON-PHARMACOLOGICAL INTERVENTIONS FOR GERIATRIC DEPRESSION

The use of non-pharmacological interventions is a crucial aspect in the treatment of geriatric depression. These interventions, either alone or in conjunction with pharmacotherapy, can ameliorate symptoms of depression in older adults (17).

Evidence supports the efficacy of psychological therapies, specifically cognitive behavioral therapy (CBT) and interpersonal therapy (IPT), in the treatment of geriatric depression. CBT focuses on identifying and modifying

negative thoughts and beliefs that contribute to depression, while IPT focuses on addressing interpersonal conflicts and relationship problems that may contribute to depression. Both types of therapy have been shown to be effective in reducing symptoms of depression in older adults (17).

In addition to psychological therapies, lifestyle changes such as regular exercise, adequate sleep, and a healthy diet can also play a role in the management of geriatric depression. Physical activity, including exercise, has demonstrated comparable efficacy to antidepressant medication in ameliorating symptoms of depression in geriatric individuals. Additionally, sufficient sleep and a nutritious diet are crucial for maintaining optimal physical and mental health (18).

Social support is also an important aspect of non-pharmacological interventions for geriatric depression. Older adults with strong social support networks are less likely to experience depression. Programs such as support groups, telephonic counseling, or in-person counseling can provide social support and help to alleviate symptoms of depression (18).

Creative therapies such as art therapy, music therapy and dance therapy can also be beneficial for geriatric depression. These therapies can be used in conjunction with other interventions and can help to improve mood, relieve stress, and foster a sense of well-being (19).

Another non-pharmacological intervention for geriatric depression is Light Therapy. Light therapy is the use of bright light to mimic natural outdoor light and can be used to treat seasonal affective disorder (SAD) and non-seasonal depression. It's been demonstrated to be effective for older adults with depression (19).

In conclusion, non-pharmacological interventions such as psychological therapies and lifestyle changes play an significant role in the management of geriatric depression. Psychological therapies such as CBT and IPT have been shown to be effective in reducing symptoms of depression in older adults. Lifestyle changes such as regular exercise, adequate sleep, and a healthy diet can also play a role in the management of geriatric depression. Social support, creative therapies and light therapy can also be beneficial for geriatric depression. It's important to consider non-pharmacological interventions as an option for older adults with depression, either alone or in combination with pharmacological treatments (20, 21).

SPECIAL CONSIDERATIONS IN GERIATRIC DEPRESSION

Geriatric depression is a complex condition that often co-occurs with other medical and psychiatric conditions. This is known as comorbidity. Comorbidities can make the diagnosis and treatment of geriatric depression more challenging, as depression symptoms may be attributed to other underlying conditions (22).

Medical conditions such as cardiovascular disease, diabetes, and chronic pain are common comorbidities in older adults with depression. These conditions can have a direct impact on the development and course of depression, as well as influence treatment response. For example, older adults with depression and chronic pain may have a reduced response to antidepressants (22).

Another important consideration in geriatric depression is polypharmacy. Polypharmacy refers to the simultaneous utilization of numerous drugs to address a single or multiple medical issues. This is particularly common in older adults, who often have multiple medical conditions requiring treatment. The concurrent administration of multiple medications, referred to as polypharmacy, can increase the likelihood of adverse drug reactions and drug-drug interactions, resulting in elevated risk of falls, cognitive impairment, and other unfavorable outcomes (23).

In addition to comorbidities and polypharmacy, end-of-life care is also an important consideration in geriatric depression. This is particularly relevant for older adults with advanced medical conditions or those nearing the end of life. Depression can be a significant issue for older adults and their families during this time. It's important that healthcare providers are sensitive to the emotional and psychological needs of older adults and their families, and that they provide support and resources to help them manage this difficult time (24).

In conclusion, geriatric depression is a complex condition that often co-occurs with other medical and psychiatric conditions. Comorbidities, polypharmacy, and end-of-life care are all important considerations in the management of geriatric depression. The use of multiple medications can increase the risk of adverse drug reactions and drug interactions. It's important for healthcare providers to be aware of these considerations and to provide appropriate care and support for older adults with geriatric depression (25).

CONCLUSION

Geriatric depression is a significant public health concern, affecting millions of older adults worldwide. Despite the high prevalence and significant impact of geriatric depression, the condition is often underdiagnosed and undertreated. The unique challenges of diagnosing and treating geriatric depression, such as comorbidities, polypharmacy, and end-of-life care, require specialized knowledge and expertise (26).

In recent years, there has been substantial advancement in the knowledge of depression in older adults. Research has improved our understanding of the causes, risk factors, and course of geriatric depression. We now have a better understanding of the unique challenges faced by older adults with depression and the importance of treating depression in this population (27).

Pharmacological treatments, including antidepressant medications, have been demonstrated to be effective in treating geriatric depression. However, non-pharmacological interventions, such as psychological therapies and lifestyle changes, also play an critical role in the management of geriatric depression (28).

Despite advancements made in the field of geriatric depression, there remains much to be accomplished in the realm of research and treatment. Future research should focus on developing new and more effective treatments for geriatric depression, as well as improving our understanding of the underlying mechanisms of geriatric depression (29). Additionally, there is a need for more research on the use of non-pharmacological interventions, such as psychological therapies and lifestyle changes, in the treatment of geriatric depression (29).

In conclusion, geriatric depression is a major public health issue that requires specialized knowledge and expertise. Despite the advancements made in recent decades in terms of understanding and treating geriatric depression, there remains a need for further research and development of treatment options. This requires sustained efforts to enhance our understanding of geriatric depression and create more effective treatments for this demographic.

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Chapter 5

ANTHROPOMETRIC OBESITY INDICES AND METABOLIC ABNORMALITIES

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INTRODUCTION

Obesity is ever-increasing throughout the world. Both adults and children are highly affected from this severe health problem. Obesity is greatly associated with many severe cardiometabolic as well as endocrine diseases. Obesity may also lead to many mood disorders such as depression and anxiety. Therefore, quite a number of ratios and indices are introduced to be able to estimate the risks confined to such metabolic abnormalities. Within this context, numerous equations are under investigation. Obesity indices are commonly used also during the evaluation of metabolic syndrome (MetS) cases (1-8).

These indices are generally divided into two groups. Those, which are derived from anthropometric measurements, and those based upon the body fat amount or distribution. The first group of indices may further be analyzed in two groups: Weight-dependent and weight-independent indices.

Names, abbreviations and the equations of the formulas used within the scope of the study were listed in Table I.

The purpose of this chapter is to give a very recent information related to each one of these indices derived from anthropometric measurements, including their formulas, their closeness to obesity degree of the individuals and the ability to determine the possible risks related to metabolic abnormalities. Within this context, two indices derived from biochemical measurements were also included.

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Table 1 Formulas Of Anthropometrıc Obesıty Indıces		
Weight-dependent Anthropometric Indices		
Abbr.	**NAME**	**Equation**
BMI	body mass index	Weight / (height)^2
HI	hip index	HC*wght $^{-0.482}$ * hght $^{0.310}$
CI	conicity index	WC/0.109 * √(wght/hght)
ABSI	a body shape index	1000 * WC*wght $^{-2/3}$ *hght $^{5/6}$
TPMI	triponderal mass index	wght/hght ^{3}
Weight-independent Anthropometric Indices		
WC	waist circumference	WC
HC	hip circumference	HC
NC	neck circumference	NC
WHR	waist C-to-hip C ratio	WC/HC
WHtR	waist C-to-height ratio	WC/Hght
WHHtR	Waist-to-hip-to-height ratio	WC/HC/Hght
(WC+HC)/2	(waist C+hip C)/2	(WC+HC)/2
PWNC	a product of WC and NC	WC * NC
BAI	body adiposity index	HC/hght $^{0.8}$
BRI	body roundness index	364.2-365.5*(1-((0.5 * WC/ p)^2/ (0.5*Hght)^2))$^{0.5}$
AVI	abdominal volume index	(2 * (WC*100)^2 + 0.7 * (WC*100-HC*100) ^{2})/1000
Indices Derived from Biochemical Measurements		
CMI	cardiometabolic index	TRG/HDL-C*WC/Hght
MetSI	metabolic syndrome index	[(INS/FBG)/(HDL-C/TRG)]*100

C=circumference, W=waist, H=hip, N=neck, wght=weight, hght=height, TRG=triglyceride, HDL-C=High density lipoprotein-cholesterol, INS=insulin, FBG=fasting blood glucose.

WEIGHT-DEPENDENT ANTHROPOMETRIC INDICES

Body Mass Index

Body mass index is one of the most commonly used indices. It requires height and weight values of the individuals. Therefore, it is a weight-dependent index. There are some objections related to its use in obesity-related studies due to the fact that this index does not contain a fat-related parameter. However, it is still used in the so-called studies efficiently. In a recent report, BMI shows a significant association with body fat percentage among university students. Therefore it is suggested that this index can be used to determine obesity in young population because it is easy to calculate (9).

Hip Index

This index uses hip circumference in addition to weight and height. However, the related equation requires numbers to be entered in superscript form. Besides, there are controversies related to the clinical utility of this index. This index has been introduced as a novel index associated with some cardiovascular risk factors and suggested as a useful anthropometric risk index for predicting MetS (10). On the other hand, it was reported that it was not an independent risk factor for diabetes mellitus (11).

Conicity Index

This index is based on the notion that people with considerable amount of fat around the abdomen are biconical, while those with less fat around the same section are cylindrical (12). Studies have pointed out the ability of CI in determining abdominal obesity (13, 14). The conicity index is reported as an independent risk factor for all-cause mortality among the non-cancer elderly (15).

A Body Shape Index

This index was introduced as a variant of conicity index not affected by the obesity paradox. A high correlation between ABSI and CI was reported. Body mass index was correlated with CI, which in turn correlated strongly with ABSI. It was also stated that ABSI may reflect the change in body shape from

cylindricity to conicity. This index was suggested as the only abdominal obesity index, which is not affected by the obesity paradox (16).

Tri-ponderal Mass Index

This index was reported as a superior index in discriminating body fat distribution more acurately than BMI (17). Tri-ponderal mass index was as effective as BMI in terms of WC, WHR, arm fat area, and body fat percentage in determining overweight and obesity in children (18).

WEIGHT-INDEPENDENT ANTHROPOMETRIC INDICES

Waist Circumference

Waist circumference along with hip circumference, head circumference and neck circumference was considered within the scope of obesity studies. It is a commonly used parameter as a component of many related ratios and indices. It was reported as a marker better than BMI and WHR in predicting Type 2 diabetes mellitus (19).

Hip Circumference

Waist circumference and hip circumference are both strongly associated with obesity. Their association with risk of death was also reported. In a recent report, it was pointed out that consideration of both waist and hip circumference in the clinical setting could help to best identify those at increased risk of death (20).

Neck Circumference

Neck circumference is a simple and reliable measurement, which correlates with other anthropometric measurements. It was stated that this parameter was not affected by external factors (21). It was reported that NC can be considered for screening overweight and abdominal obesity and was the most preferred anthropometric method (22).

Waist-to-Hip Ratio

This ratio is being used commonly in obesity studies. In a study, it has been stated that WHR, as an anthropometric index, outperformed both BMI and WC in T2DM patients (23). In another report, it was reported that BMI and WC showed better performance for the identification of cardiometabolic risks than

WHR (24). Waist-to-hip ratio causes anthropometric inconsistency and bias in predicting myocardial infarction (25).

Waist-to-Height Ratio

This ratio is described as a hallmark of central obesity, one of the potential obesity indicators for determining the presence of cardio-metabolic risk (26, 27) and appears to be more closely related to diabetes than BMI and WHR (28, 29). It was suggested as the best index to discriminate metabolic abnormalities (30), an effective indicator for detecting adiposity (31). It was also recommended for home-based obesity screening studies among the pediatric population (32).

Waist-to-Hip-to-Height Ratio

This ratio is also an abdominal obesity indicator such as WC and is suggested as one of the predictor for CVD mortality than BMI (33). Along with WHtR, this ratio were reported as more valuable indices than BMI and WC for the prediction of cardiovascular disease risk factors (34).

Waist Circumference+Hip Circumference/2

Both WC and HC are commonly used athropometric measurements. Both parameters increase steadily as the severity of obesity increases. In recent studies, (WC+HC)/2 has been introduced as a new obesity marker to be used in routine clinical practices. Also significant associations were found between (WC+HC)/2 ratio and (trunk fat+leg fat)/2 (TF+LF)/2 ratio. This point was important because it reflects the association between an anthropometric and a fat-based indices (35, 36).

A Product of Waist and Neck Circumferences

Both WC and NC are valuable parameters during the evaluation of obesity studies. A product of waist and neck circumferences was reported as a superior index to traditional anthropometric parameters such as WC, BMI or WHR as an obesity indicator for the presence of MetS with diabetes mellitus (37).

Body Adiposity Index

Among the other obesity indicators this index was not effective for discriminating high cardio-metabolic risk (27). This index was also suggested as inapplicable due to its low validity for estimating body fat (38).

Body Roundness Index

This index is the only index, which requires π in addition to WC and height of the individuals for calculation. It was found to be shown superior performance and significant association with cardiometabolic risk factors among some other obesity indicators such as BAI or ABSI (27). This is suggested as one of the best indices fot MetS prediction (8, 39).

Abdominal Volume Index

This index was reported as one of the strongest anthropometric discriminators of MetS (40, 41). It is known that obesity is a risk factor for mood disorders such as depression and anxiety. As an indirect measure of abdominal obesity along with WC and body fat, it was also suggested as a useful parameter for the prediction of the relationship between obesity and depression and/or anxiety (7).

INDICES DERIVED FROM BIOCHEMICAL MEASUREMENTS

Cardiometabolic Index

This index is a rather new index for predicting obesity-related diseases. Individuals with metabolically obese normal weight (MONW) phenotype may be under extremely high-risk for unfavorable health consequences. However, they may not be detected due to normal BMI. Cardiometabolic index was suggested as a valuable indicator to identify the individuals with this phenotype (42).

Cardiometabolic index can be used as a reference predictor due to its strong association with the risk of metabolic associated fatty liver disease (MAFLD) and is of clinical value for the early identification and screening of MAFLD (43).

Metabolic Syndrome Index

This is a recently developed index (44). Since the related formula contains biochemical components, which should be considered during MetS diagnosis, it is called MetS index. These components are also important from the cardiovascular point of view. Therefore, this index may be of clinical use for the prediction of both cardiovascular and MetS risk during childhood obesity.

CONCLUSION

In this chapter, the equations introduced for the interpretation of obesity development were presented. Their potential clinical uses for various disease states other than obesity were emphasized. The structures of formulae were given. The advantages and disadvantages of these formulae were explained under the light of recent scientific and medical reports.

The common feature of all formulae was their attempts to determine the body fat profile of the individuals although they use anthropometric measurements. Body mass index, TPMI, WC/HC, WHtR, WHHtR, PWNC and (WC+HC)/2 were easy-to-calculate ratios and indices. The remaining part of the list was composed of equations, which require complicated mathematical processes. Considering the fact that each formula may also be helpful for the evaluation of many other clinical abnormalities, these sophisticated formulae may be in use for the specific purpose.

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