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Late on-Set Hypogonadsim, Anxiety and Depression: A Cross-Sectional Survey

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ABSTRACT

Andropause or late on set hypogonadism involves a gradual, progressive decline in bioavailable testosterone in aging male, presenting with an array of somatic, sexual and psychological symptoms. While the physical and hormone changes are well documented, the distinct mental health impact specifically regarding clinical anxiety and depression patterns remains underrepresented within empirical psychological models. This investigation quantitively evaluates the relationship between the severity of andropause and symptoms of anxiety and depression in middled aged and older males.An exploratory cross sectional quantitative designs were arranged using a cohort N= 25 male participants aged 40 and above. Psychometric data collection was operationalized via the aging male symptoms(AMS) scale as the primary independent variable. The dependent variables of Anxiety and Depression were quantified using the Generalized Anxiety Disorder (GAD-7) and Patient Health Questionaire-9(PHQ-9) respectively. Statistical processing included descriptives metrics and Pearson product moment correlation coefficient(r).Bivariate correlation matrices revealed a strong, positive and statistically significant association between overall LOH severity and elevated scores on both the GAD -7 (r= 0.524, $p < 0.01$) and the PHQ-9 (r= 0.561,$p < 0.01$). The data showsdemonstrate that the andropause transitions are heavily intertwined with male psychological vulnerabilities even within a controlled exploratory cohort.Widespread clinical implementations of standardized psychometric screenings within routine mid-life medical checkups are imperative for early therapeutic interventions and specialized psychological care.

***Keywords**: Andropause, Late Onset Hypogonadism, Anxiety, Depression.*

Introduction

As men move into middle age and beyond, they experience gradual changes in both physical health and hormonal balance. Unlike female menopause, which involves a sudden drop in estrogen and the end of reproduction, men undergo a much slower decline in circulating testosterone levels(Hauger et al., 2022). This condition, known as andropause or late-onset hypogonadism (LOH), typically involves a testosterone decrease of about 1% per year after age 40(Indirli et al., 2023). Because this shift occurs gradually, its psychological effects are often missed or misattributed to non-specific life stress.

While men frequently seek medical help for physical symptoms- such as persistent fatigue, reduced muscle mass, abdominal weight gain erectile difficulties- the emotional challenges receive far less attention (Li et al., 2019). However, testosterone plays an important role in regulating central nervous system functions and mood stability(Giagulli et al., 2020).As a result, a decline in testosterone

can lower a man's resilience to stress and increase his vulnerability to mood disorders (Mokhwelepa&Sumbane, 2025).

Generalized anxiety and depression are two of the most common psychological challenges during this phase of life:

Anxiety often appears as continuous worry, tension, irritability and physical restlessness.

Depression typically manifests as persistent low mood, loss of interest in daily activities, change in sleep patterns and reduced vitality(Li et al., 2019).

When evaluated using standard, validated tools like the Generalized Anxiety Disorder-7 GAD-7;(Rutter & Brown, 2017)and the Patient Health Qustionaire-9 PHQ-9; (Kroenke, 2021), these symptoms often reach levels that warrant professional support.

Understanding this connection is essential for counselling and behavioral health. Traditional social expectations often prevent men from seeking help for emotional distress. However, framing mood shifts around an objective biological transitions like andropause can reduce stigma and encourage men to seek timely psychological care.

Literature Review

Hormonal Decline and Mood Regulation:

Testosterone acts as a key chemical messenger in brain regions responsible for emotional control, including the amygdala, hippocampus, and prefrontal cortex(Giagulli et al., 2020). Preclinical and clinical research shows that reduced androgen levels can amend serotonin and dopamine pathways, which are critical for maintaining affective stability. When testosterone drops below optimal levels, men become more vulnerable stress responses (Hauger et al., 2022).

Andropause and Depressive Symptoms:

Studies consistently show a connection between aging male symptoms and elevated depression (Martelli et al., 2021). Physical fatigue, reduced physical capacity and changes in body composition can weaken a man's sense of confidence and independence (Li et al., 2019). These physical changes, combined with neurochemical shifts, frequently trigger feelings of helplessness, persistent sadness, and loss of interest in meaningful activities (Indiril et al., 2023).

The Role of Anxiety

Although less frequently studied than depression in aging males, generalized anxiety is a significant concern during andropause. Symptoms likenight sweats, sleep disruptions, and sudden energy drops can create continuous physical discomfort (Barnes et al., 2020). This chronic discomfort often leads to psychological tension, health-related worries, and heightened nervousness about maintaining personal and professional roles(Kalin, 2020)

Objectives and Hypotheses

This study evaluates how the severity of Andro pausal symptoms relates to anxiety and depression in a cohort of N= 25.

This study tests two key hypotheses:

Hypotheses 1h1: Higher severity of andropause symptoms (AMS score) will significantly correlate with higher levels of anxiety (GAD-7 score).Hypotheses 2h2: Higher severity of andropause symptoms (AMS score) will significantly correlate with higher level of depression (PHQ-9 score).

Methodology

- **Research Design:** This study utilized a non- experimental, cross – sectional quantitative design. This structure allowed for measuring independent and dependent variables simultaneously to identify statistical associations without manipulating the participants environment.

Sample and Recruitment

The sample consisted of N=25 men recruited through convenience sampling for an initial exploratory study.

Inclusion Criteria: Males aged 40 years or older who could independently complete self -report surveys.

Exclusion Criteria: Men with a history of major neurocognitive disorders or those currently receiving testosterone replacement therapy (TRT), as exogenous hormones would confound baseline measurements.

Data Collection Tools

Participants completed a standardized digital survey containing three validated assessment instruments:

Aging Males Symptoms (AMS) SCALE:

A 17- item scale assessing overall symptom severity across somatic, psychological, and sexual domains (Li et al., 2019). Items are rated from 1 (None) to 5(Extremely Severe).

Generalized Anxiety Disorder-7 (GAD-7): A 7-item tool measuring the frequency of anxiety symptoms over the past two weeks, scored from 0 (Not at all) to 3 (Nearly every day)(Rutter & Brown, 2017).

Patient Health Questionaire-9 (PHQ-9): A 9-item tool measuring the frequency and severity of depressive symptoms over the past two weeks using the same 0-to-3 scoring scale (Kroenke, 2021).

Data Analysis

Analysis was performed using standard statistical software.

Descriptive statistics summarized demographic characteristics and mean scores.

Pearson product -moment correlation coefficients (r) evaluated the linear relationships between the variables to test H1 and H2.

Descriptive Statistics

Descriptive statistics were calculated for the total scores of Andropause symptoms (AMS), Anxiety (GAD-7),and Depression(PHQ-9) across the sample (N=25). The mean score for Andropause Symptoms was M= 36.76 (SD=15.46, range= 17.00-69.00). For Anxiety Symptoms (GAD-7), the sample mean score was M= 5.92 (SD=5.26, range=0.00-20.00). For Depression Symptoms (PHQ-9), the sample mean score was M=5.96 (SD=6.74, range=0.00-26.00).

A complete summary of the descriptive statistics is presented in table 1.

Table 1: Descriptive Statistics for study variables

Variables	M	SD	Min	Max
AMS	36.76	15.46	17.00	69.00
GAD-7	5.92	5.26	0.00	20.00
PHQ-9	5.96	6.74	0.00	26.00

Correlation Analysis

The correlation coefficients (r=0.912, $p < .001$ for anxiety and r=0.839, $p < .001$ for depression) demonstrate a statistically significant, strong positive correlation.

The complete correlation matrix is presented in Table 2.

Table 2: Pearson Correlation Matrix Among AMS, GAD-7 and PHQ-9 Total Scores.

Variables	1	2	3
AMS Total	_		
GAD-7 Total	.0912	_	
PHQ-9 Total	.839	.890	_

Discussions

The findings confirm that andropause symptoms are closely tied to anxiety and depression in men over 40.

Although based on an exploratory cohort (N=25), the results highlight that male hormonal aging involves meaningful psychological changes alongside physical ones. The strong positive correlations fully supported Hypotheses 1 and 2, aligning with prior literature showing that higher aging symptom burdens correspond to greater psychological distress (Indirli et al., 2023; Li et al., 2019). When physical vitally

drops and bodily disruptions occur, a man's overall coping is strained, making anxiety and depression more likely.

Conclusion & Limitation

This study demonstrates that the severity of andropause symptoms is significantly correlated with anxiety shows a clear pattern: as andropause symptoms severity increases, anxiety and depression levels rise accordingly. Addressing male mid-life health effectively requires an integrated approach that connects physical assessment with psychological care.

Limitations

Several limitations should be considered when interpreting these findings:

Sample Size (N=25): The small exploratory sample limits how broadly these results can be generalized.

Cross-Sectional Framework: Data was collected at a single point in time, preventing conclusions about long tern cause-and-effect relationships.

Self-Reported Measures: The data relies on self-reported questionnaire, which can be subject to individual interpretation.

Absence of Biological Testing: The study measured self-reported symptoms rather than direct serum testosterone levels.

Future research should expand to larger, more diverse samples, utilize longitudinal tracking, and combine psychological screening tools with direct hormone testing to further evaluate these relationships over time.

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