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Original Research

A Cross-sectional Study of Correlation Between Andropause and Anxiety Disorders Among Police Officers in Bali

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Abstract

Andropause is a clinical and biochemical syndrome associated with increasing age characterized by a decreased testosterone level. Anxiety disorders are mental disorders that differ from normal feelings of nervousness or anxiousness and involve excessive fear or anxiety. Police officers has a high risk of experiencing andropause and anxiety disorders because of the andropause. This research aims to determine the correlation between andropause and anxiety disorders in Bali police officers. This research was carried out with a cross-sectional analytic design. Andropause was measured using an ADAM questionnaire. Anxiety disorder was measured using a BAI questionnaire. The sample for this research was male police officers aged between 35-58 years who worked at the Ditreskrimsus Polda Bali. The sample was determined using a purposive sampling technique. The sample for this research consisted of 50 people. The results showed that 60% of samples were positive for andropause and 62% of samples were positive for anxiety disorders. There are 52% sample that tested positive for both andropause and anxiety. There is a significant correlation between andropause and anxiety disorders with p value <0.001. Calculated Relative Risk (RR 95% CI) between andropause and anxiety disorders was 3.984 (1.645-9.646). Police officers that experiencing andropause have a 4 times higher risk of experiencing anxiety disorders compared to police officers that not experiencing andropause. There is a significant correlation between andropause and the occurrence of anxiety in police officers in Bali.

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1. Introduction

People inevitably undergo a natural process known as aging as they get older. Aging in men tends to be sooner compared to women because men have higher muscle mass, higher bone mineral density, lower fat mass, and faster metabolism. Aging men tend to have below normal testosterone levels, while testosterone plays a crucial role in physiological functions and maintaining sexual characteristics. Low testosterone results a decrease physiological function.[1] Disturbances in physiological functions due to low testosterone levels in aging men known as andropause. Andropause is a clinical and biochemical syndrome associated with aging, characterized by a decrease in testosterone levels in blood.[2] Andropause typically occurred around late 40s to early 50s.[1,3]

Research on andropause is still limited.[4] This can have an impact on a global health problem as the aging male population is increasing.[5] The impact of aging, particularly on the male population, is multifaceted and has significant implications for various aspects of society, such as increasing the burden of healthcare costs, need of long-term care, and need of social support systems. UN projections indicate that by the end of 2040, 18% of the population will be at the age of 65.[6] WHO predicts by 2050, it is estimated that men over the age of 65 will reach 1.5 billion with 2–6% of them experiencing andropause symptoms.[7] Lack of research also results in low awareness that lead to underdiagnosis and inadequate treatment of andropause.

Men that experiencing andropause in several countries like Asia, America, and Europe is quite high. Data indicates that in Massachusetts, United States, men aged 40–69 that experiencing andropause have reached 481 thousand new cases per year.[8] Worldwide data in the last decade indicates around 1 to 3 men in their 60s and over 80% of men in their 80s experience physical and psychological changes due to andropause. Additionally, more than 70% of men over the age of 40 exhibit symptoms of andropause.[4] Research data from Badung, Bali, Indonesia, indicates that 55% men aged 35–60 experience andropause.[9] Another study conducted in Banggai, Central Sulawesi, Indonesia, states that 68% of men over the age of 40 experience andropause.[10]

Andropause symptoms is vary and affect many aspects such as mental and physics. The most common symptoms is decreased libido, erectile dysfunction, lack of energy and motivation, muscle pain and atrophy, decreased memory performance, hair loss, sleep disturbances, and urinary incontinence.[3,11] Other less specific symptoms is mood changes, such as anxiety. Data indicates that 37 of 143 men aged 40–49 in Kuwait, experienced anxiety as the main symptoms of andropause.[8,12]

Anxiety is a sense of worry caused by stress and related to anxiety disorders, a mental disorder that differs from normal feelings of nervousness or anxiousness and involves excessive fear or anxiety. Anxiety disorders can affect anyone, even adults and elderly.[13] A study conducted in 44 countries suggests that the global prevalence of anxiety disorders is quite high, it is estimated around 7.3%. The study adds that approximately 1 in 9 people will experience anxiety disorder each year. Additionally, data suggests that men aged 35–54 have a 20% higher risk of experiencing anxiety disorders compared to men aged 55 or above.[14]

All aging men are at risk of andropause, and the risk increases if having a poor health status. Stress, obesity, smoking, and diabetes mellitus increases the risk.[15] According to the data, police officers rank the second professions that experience high levels of stress.[16] Obesity is one of the most challenging issues for police officers to overcome.[17] Data from 2020, indicates that 45.5% of police officers in Bali experienced obesity.[18] Smoking as an unhealthy lifestyles also a challenging issues. As 63.6% of police officers in Bali aged 35–54, have moderate smoking habits.[18] Data from 2016, indicates the occurrence of diabetes mellitus among police officers in the Bali Regional Police has reached 37%.[19]

Other risk factors among police officers are free radicals. Police work environment is synonymous with uncontrolled exposure. UV, pollution, and other oxidative stress factors can accelerate aging, making police officers more vulnerable to the risks of andropause. Additionally, police officers often neglect their own health. Mental health issues such as anxiety are rarely notice, while the prevalence of anxiety among police officers are quite high, it is reached 96.04% with 4.43% is anxiety.[20]

Therefore, police officers in the Criminal Investigation Department (Ditreskrimsus) of Bali Regional Police is chosen as the research sample to analyze the correlation between andropause and anxiety disorders. There was no particular reason for choosing this department. High prevalence of andropause and anxiety disorders gave encouragement to investigate more about both issues, especially the anxiety that experienced by andropausal men. This research is expected could serve an informative resource to help giving a

solution to andropause that often under diagnosed and untreated properly due to lack of knowledge. Hope this study can provide solutions to the increasing elder population.

2. Method

This research is a cross-sectional analytic design.[21] The sample of this study is male police officers aged 35–58 that worked in Special Criminal Investigation Directorate of Bali Regional Police. This age range was chosen to avoid bias in results. Young people or those below this age range tend to experience anxiety that is not related to andropause but anxiety due to other events.

The sample criteria are male police officers, aged 35–58, married, stationed in the Special Criminal Investigation Directorate of Bali Regional Police, and agreed to this research informed consent. The sampling technique used is purposive sampling, this technique chosen to ensure the research objectives are met, and the samples are more relevant. Total samples in this study consist of 50 samples that have met the inclusion criteria.

Dependent variable in this study is andropause, measured using ADAM questionnaire consisting of 10 'Yes' or 'No' questions. Andropause is considered positive if the subject answers "Yes" to question number 1 or 7, or more than 3 questions in the ADAM questionnaire. Independent variable in this study is anxiety disorder, measured using BAI questionnaire consisting of 21 Likert scale questions. Anxiety disorder is considered positive if the BAI questionnaire score is 8-63, while it is considered negative if the BAI questionnaire score is 0-7. Control variables in this study include age, smoking history, alcohol consumption history, obesity, and past medical history. Control variable refers to a factor that is held constant or controlled to prevent it from influencing the relationship between the independent and dependent variables being studied.

Data to prosses is obtained from primary data of ADAM and BAI questionnaires. The instrument that used to process the data is Microsoft Excel and Microsoft Word. Data analysis is conducted using Statistical Package for the Social Sciences version 29.0. The statistical analysis in this study includes univariate and bivariate analyses, all categorical data are converted into percentages, the correlation is tested using Pearson Chi-Square test, and calculations of relative risk (RR 95% CI).

3. Result

The characteristics of samples include age, body mass index, and past medical history. The results of the sample characteristics can be seen in Table 1.

Table 1. The Characteristics of The Research Sample

Variables	Frequency (n = 50)	Percentage (%)
Age		
Transition (35-45 years)	20	40
Clinical (46-58 years)	30	60
Body Mass Index		
Normal (<25)	10	20
Normal (18,5-22,9)	7	14
Overweight (23-24,9)	3	6
Obese (≥25)	40	80
Obese I (25-29,9)	32	64
Obese II (≥30)	8	16
Past Medical History		
Yes	7	14
Hypertension	3	6
Diabetes Mellitus Type-2	2	4
Dislipidemia	1	2
Metabolic Syndrome	1	2
No	43	86
Andropause		

Variables	Frequency (n = 50)	Percentage (%)
Positive	30	60
Negative	20	40
Anxiety Disorder		
Positive	31	62
Mild	22	44
Moderate	7	14
Severe	2	4
Negative	19	38

Table 2. The Characteristics of The Research Sample

Age (years)	Andropause				Total	(%)
	Positive	(%)	Negative	(%)		
Transition (35-45)	5	(10)	15	(30)	20	(40)
Clinical (46-58)	25	(30)	5	(10)	30	(60)
Total (%)	30	(60)	20	(40)	50	(100)

Table 3. The Prevalence of Anxiety Disorders in Police Officers in Bali Based on Age

Age (years)	Anxiety Disorders				Total	(%)
	Positive	(%)	Negative	(%)		
Transition (35-45)	5	(10)	15	(30)	20	(40)
Clinical (46-58)	26	(52)	4	(8)	30	(60)
Total (%)	31	(62)	19	(38)	50	(100)

Tabel 4. The Correlation Between Andropause and Anxiety Disorders in Police Officers in Bali

Anxiety Disorders	Andropause				Total	(%)	p	RR
	Positive	(%)	Negative	(%)				
Positive (%)	26	(52)	5	(10)	31	(62)	<0,001	4
Negative (%)	4	(8)	15	(30)	19	(38)		
Total (%)	30	(60)	20	(40)	50	(100)		

Based on Table 1, most of the samples is categorized at the 46-58 age, indicating a clinical aging stage. A total of 80% of the samples are categorized as obese with a Body Mass Index ≥25. Most samples have no history of previous illnesses. However, a small portion of the samples with a past medical history can be detailed as hypertension (6%), type-2 diabetes mellitus (4%), dyslipidemia (2%), and metabolic syndrome (2%).

Andropause is measured using ADAM questionnaire. The detailed results of the ADAM score questionnaire can be seen in the appendix. Most of the samples agreed with 'No' responses to statement number one (76%). Statement number seven is also dominated by 'No' responses (78%). The statement with the highest 'No' responses is statement number four, which relates to height. Only 6% of the samples felt a decrease in their height, while almost all of them did not feel a change in their height.

About 62% samples felt a decrease in energy. About 58% of the samples also experienced a decrease in strength, endurance, or both. Many samples also felt a decline in their ability in recent sports activities, totaling 58%. However, many samples answered 'No' to the statement about feeling a reduction in the enjoyment of life, accounting for 90%. Statements regarding feeling sad or moody were also denied by 92% of the samples.

Table 2 presents a 2x2 table between the total positive andropause samples and age. Table 2 shows that there are 30 police officers in Bali who test positive for andropause that makes the prevalence of andropause in police officers in Bali is 60%. Andropause is most experienced by men aged 46-58, corresponding to the clinical aging phase.

Anxiety disorder is measured using the BAI questionnaire. The detailed sample responses can

be found in the appendix. The symptoms most experienced by samples are tingling or numbness, with a percentage of 70%. The second most prevalent symptom is the fear of something bad happening, with a percentage of 64%. The third most prevalent symptom is digestive issues, with a percentage of 62%. Symptoms less frequently experienced by the samples include a feeling of choking, difficulty breathing, and fear of dying, all ranking first with 94%. All samples agreed that the symptoms listed in BAI questionnaire are not felt severely, as the results show that all scale three scores are at 0%.

Table 3 presents a 2x2 table between the total positive anxiety disorder samples and age. According to Table 3, there are 31 sample tested positive for anxiety disorders that indicates the prevalence of anxiety disorders in police officers in Bali is 62%. The samples tested positive for anxiety disorders are mostly in the age range of 46-58 years.

Correlation between andropause and anxiety disorder was obtained from the bivariate analysis of the 2x2 table. Bivariate analysis in this study utilized the Pearson Chi-Square test. The results of the analysis indicate a significant correlation between andropause and anxiety disorders ($p<0.001$). Based on these results, it is found that men with andropause tend to have a higher likelihood of experiencing anxiety disorders. The results of the Pearson Chi-Square analysis are presented in Table 4.

Based on Table 4, the sample positive for andropause and anxiety disorders has a much higher percentage compared to others. About 52% of the positive andropause samples experience anxiety disorders. The calculated odds ratio (RR 95% CI) for anxiety disorders due andropause is 3.984 (1.645-9.646). This mean, police officers that experiencing andropause are at a 3.984 times higher risk of experiencing anxiety disorders compared to police officers that do not experience andropause.

4. Discussion

Age is a significant risk factor for andropause, as testosterone levels decrease by 1% per year starting at the age of 30. At the age of 45, men will lose half of the testosterone levels they had in their healthy 20- to 30-year-old counterparts.[11] The data related to the 80% of samples experiencing obesity does not differ significantly from the 2020 study conducted by Cahyani, which found that 45.5% of police officers in Bali were obese.[18] This is also in line with the opinion of the Indonesian Ombudsman, who states that one of the most challenging health issues in the police force is obesity.[17] Another study conducted by Ulinnuha provides data that indicating 61.7% men with andropause also had obesity.[22] Research by Subandriya about the risk factors for andropause, found that obesity is a significant risk factor for andropause.[23]

Regarding past medical history, a small portion of the sample had a history of previous illnesses such as hypertension, type-2 diabetes mellitus, dyslipidemia, and metabolic syndrome. Based on interviews, Bali Regional Police always provides health screening facilities, leading to assumption that chronic diseases that affecting performance of work are well controlled. However, it cannot be denied that the risk factors for andropause are very complex. Chronic diseases such as diabetes, hypertension, hypercholesterolemia, metabolic syndrome, and others can increase the risk of andropause occurrence.[24–26]

The answer of ADAM questionnaire obtained in this study do not differ significantly from the 2021 study conducted by Pinto. The results indicate that 65% of the samples did not perceive a decrease in libido and did not experience a decline in erectile strength.[9] This could be attributed to the fact that male sexual desire tends to remain consistent after marriage compared to women.[27] This study also found that almost all samples did not perceive any changes in height. This may be due to the fact that significant height loss more commonly occurs in men above the age of 70, even though height begins to gradually decrease in men after the age of 40.[28]

The prevalence data of andropause obtained at 60% in this study aligns with Pinto's research conducted in Badung, which reported that 55% of men experience andropause.[9] Another study conducted in Malang by Bachtiar stated that 35 out of 60 samples, or 58.3%, tested positive for andropause.[29] The study in Central Sulawesi conducted by Djafar in 2020 similarly stated that the prevalence of andropause is 68%.[10]

Relatively high occurrence of andropause in this study may be attributed to the profession of the samples as police officers, involving light to moderate occupational activities. Samples assigned to Special Criminal Investigation Directorate of Bali Regional Police mostly engage in sedentary work. This is because officers aged over 25 usually

spend more time on office assignments. As a result, most of the samples work in a moderate physical activity. This statement supported by Ulinnuha's research, which found that the highest andropause occurrence is in the group of light physical activity.[22]

Andropause is experienced most by men aged 46-58, which corresponds to the clinical phase of aging. This supports Djafar's research with similar findings that 68% of men experiencing andropause are over 40 years old.[10] Similar findings are indicated by Soewarno's research, where men in the age range of 50–54 years showed a 62% positive rate for andropause.[30] This supports the theory of declining testosterone levels in aging men, attributed to the diminished capacity of the testes to produce testosterone.[10]

The prevalence of anxiety is quite high at 62%, aligns with the findings of a meta-analysis study that states the global occurrence of anxiety disorders was high.[31] This study found that the majority of samples experiencing anxiety disorders were in the age range of 46–58 years. This aligns with a 2016 study stating that adults are the most vulnerable age to anxiety disorders. Adult men aged 35–54 years have a 20% higher risk of experiencing anxiety compared to men aged 55 years and older.[14] The recent study by Wijaya also shares a similar perspective, indicating that mild, moderate, and severe anxiety are more prevalent among adults compared to teenagers.[32]

According to Aziz, mental health such as anxiety are rarely noticed by police officers, but the incidence is surprisingly high. This is supported by his findings, which align with this study, indicating a significant level of anxiety with an incidence rate of 96.04%, of which 4.43% are indicative of severe anxiety disorders.[20] A study conducted in 2016 stating that 11.6% of people will experience some degree of anxiety disorder in any given year.[14] Community-based sample studies indicate similar data, suggesting that 33.7% of the population will be affected by anxiety at least once in their lives.[33]

The results of the analysis on the correlation between andropause and anxiety disorders indicate a significant correlation. This aligns with research conducted by Maha, indicating that 26.6% of men aged 40-49 who tested positive for andropause suffered from anxiety disorders as the main symptom of andropause.[8] Similar findings are presented by Khosravi in their research, suggesting that andropause leads to excessive anxiety, resulting in a higher incidence of anxiety disorders among men testing positive for andropause.[34]

The calculated relative risk is 3.984 (1.645-9.646). This study is consistent with Lee's research, which aimed to demonstrate that men with andropause are at a higher risk of experiencing anxiety compared to men of the same age who do not have andropause.[35] Andropause can disrupt mental health due to the symptoms experienced by individuals going through andropause. The symptoms arising from andropause, especially physical and sexual symptoms, have a direct impact on mental health conditions.[36] The decrease in energy and disturbances in vitality have negative impacts on cognitive patterns and mental health.[37]

Therefore, the only way to prevent the occurrence of anxiety disorders due to andropause is by addressing andropause itself.[1] The management of andropause can be approached through various methods, both pharmacological and non-pharmacological. If the age is over 35 and starts experiencing symptoms due to low testosterone, it is highly recommended to seek treatment from a doctor. However, lifestyle changes are also crucial. Diet, exercise, and counseling have been proven to have positive effects on maintaining testosterone levels and aiding the body in producing happiness hormones such as endorphins.[3]

5. Conclusion

This research concludes that there is a significant correlation between andropause and anxiety disorders in police officers in Bali, with a p-value <0.001. Police officers experiencing andropause have a 3.984 times higher risk of experiencing anxiety disorders compared to police officers without andropause.

However, there are some limitations in this study, such as a relatively small sample size. Greater sample size that aged in clinical phase may influence the results, because this phase tends to be positive for andropause. Using ADAM and BAI questionnaire as a diagnostic tool is also a limitation, because the diagnosis is not from laboratory tests results, but only based on clinical symptoms. There is also a potential of dishonesty which cannot be eliminated. Data processing error is also limitations of this study.

There are several recommendations to increasing awareness among men about the risks of aging, namely andropause, can help prevent symptoms of andropause-induced anxiety. If individuals are over 35 years old and begin to

experience symptoms due to low testosterone levels, it is highly recommended to seek appropriate treatment from a doctor. Educating all men to maintain a healthy lifestyle, including diet, exercise, and counseling, is crucial to preserving testosterone levels.

Author's Contribution

All authors have contributed to the final manuscript. The contribution of each author as follow: collected the data, drafted the manuscript and designed the figures, devised the main conceptual ideas and critical revision of the article. All authors discussed the results and contributed to the final manuscript.

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Conflict of Interest

No potential conflict of interest was reported by the authors.

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Ethics Approval

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