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Original Research Article

Profile of Ankle Sprain Patients at Pusdokkes Polri Bhayangkara Tertiary Hospital

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Abstract

Background: Ankle sprain is a musculoskeletal injury with the highest incidence rate in the world. Risk factors for ankle sprain are age, gender, sport, anatomical abnormalities, and body mass index (BMI). There is still contradiction as to whether gender is a risk factor for ankle sprain. Furthermore, there has been no research on ankle sprain regarding members of the Police Force as a risk factor. **Objective:** This research aims to determine the relationship between patient profile and acute ankle sprain at Pusdokkes Polri Bhayangkara Tertiary Hospital. **Methods:** This study took 124 research subjects, with consecutive sampling analysis, was an observational analytic study with a cross sectional research design involving patients diagnosed with ankle sprain in 2022 – 2023 at Pusdokkes Polri Bhayangkara Tertiary Hospital who met the inclusion and exclusion criteria. **Result:** As many as 79% of the subjects were aged 19 – 44 years (p=0.333). It was found that 52.4% of the subjects were male (p=0.944). As many as 46% of the subjects were members of the Police Force (p=0.181). **Conclusion:** Age, gender, and occupation had no significant association with the incidence of acute ankle sprain in this research. Male police officers aged 45 – 59 years have a higher risk of experiencing acute ankle sprain. The implication of this study is to prevent at-risk groups and/or ankle sprain patients.

Keywords: ankle sprain, age, gender, occupation

INTRODUCTION

Ankle sprain is an ankle ligament injury that causes damage to the structure and function of the ligaments (Azzahra & Supartono, 2021; Ruiz Sánchez et al., 2022). The injury causes inflammation, so

that the ankle looks swollen, feels warm, and be tender. Patients experience impaired function, such as standing, walking, and more (Halabchi & Hassabi, 2020).

Based on Riset Kesehatan Dasar (2018) data, the overall national prevalence of dislocation injuries is 32,8%. DKI Jakarta has a higher prevalence than the national rate, which is 38,7%. Based on the characteristics of the respondents, the highest prevalence was 45 – 54 years old (38,7%), females (33,1%), and military/Police (39,1%).

Risk factors for ankle sprain are age, gender, type of sport, anatomical abnormalities, and Body Mass Index (BMI). Muscle and ligament strength, hyperlaxity, trauma, and occupation are also cited as increasing the risk (Azzahra & Supartono, 2021). Ankle sprain may be accompanied by a concomitant orthopedic disorder, such as strain, fracture, tendon rupture, or dislocation, which is then referred to as a complex ankle sprain (Chanotakis et al., 2023).

In addition to the above, arthrosis may also occur. Arthrosis or osteoarthritis is a condition caused by changes in the fluid and structure of cartilage tissue (Supartono, 2017). Another common injury is an Anterior Cruciate Ligament (ACL) rupture. An ACL tear is a condition in which the ligament of the knee is torn (Legnani & Ventura, 2023). As for plantar fasciitis, it is an inflammation of the soft tissues of the sole of the foot (Supartono, 2017).

Based on the Indonesian Ministry of Health (2016), age is categorized into 5 groups, namely children (6 – 10 years old), adolescents (11 – 18 years old), adults (19 – 44 years old), pre-elderly (45 – 59 years old), and elderly (≥ 60 years old). Since the researchers wanted to examine occupation as a risk factor, the adult and pre-elderly age groups were used in this study. The researcher wanted to find out more about whether age is a risk factor for ankle sprain.

According to Delahunt & Remus (2019), gender has no significant relationship with the incidence of ankle sprain. However, Azzahra & Supartono (2021) found the opposite, gender is a risk factor for ankle sprain. So there is still contradiction whether gender is a risk factor for ankle sprain. Therefore, researchers want to find out more about whether gender is a risk factor for ankle sprain.

There has been research on the risk factors for ankle sprain in military personnel. However, there has been no research on ankle sprain as a risk factor in police officers. Therefore, the researcher wants to know if police officers are a risk factor for ankle sprain. From the medical record data, the researcher will categorize the research subjects into police officers and nonpolice officers. Members of Police Force are research subjects with the category of members of the Police in the medical records. While non-members of the Police are research subjects with categories other than members of the Police in medical records.

In line with this, the researcher is interested in conducting research at Pusdokkes Polri Bhayangkara Tertiary Hospital, East Jakarta, which is a Police referral hospital. Based on data from 2020-2023, 896 patients were diagnosed with ankle sprain. By doing so, the researcher wants to know the relationship between patient profiles and the incidence of acute ankle sprain at Pusdokkes Polri Bhayangkara Tertiary Hospital in 2022 – 2023. This study provides information on risk factors for ankle sprain in police officers.

MATERIALS AND METHODS

The research design used in this study was observational analytical research with a cross sectional research design. This study uses secondary data in the form of medical records of ankle sprain patients diagnosed from January 1, 2022 to December 31, 2023 at Pusdokkes Polri Bhayangkara Tertiary Hospital. The samples in this study were ankle sprain patients at Pusdokkes Polri Bhayangkara Tertiary Hospital totaling 124 patients. The inclusion criteria for these patients were patients diagnosed with acute ankle sprain and aged 19 – 59 years old. The exclusion criteria were patients with acute ankle sprains who had undergone surgery and/or patients with acute ankle sprains who didn't have complete medical record data. If the subject is not willing, the sampling analysis used is total sampling.

Data used were age, gender, and occupation. Data analysis was performed using univariate and bivariate analysis with IBM SPSS Statistics for Windows Version 26.0 from the Computer Lab of Faculty

of Medicine Universitas Pembangunan Nasional Veteran Jakarta. Researchers conducted bivariate analysis with the aim of testing the hypothesis and determine the relationship between two variables. In this study, researchers used chi-squared analysis to determine the relationship between patient profiles and the incidence of acute ankle sprain at Bhayangkara Hospital Level I Pusdokkes Polri in 2022-2023. This study was ethically reviewed by the Ethics Committee of Pusdokkes Polri Bhayangkara Tertiary Hospital with ethics review number KET/EC-168/VII/2024/RS.BHAY.TK.I.

RESULTS

In general, the number of male patients, occupations, and types of ankle sprain injuries were balanced. However, in the age category, there were more adult patients (19 – 44 years old) (Table 1). The data showed that the type of ankle injury was mostly simple. However, there was a high incidence of acute complex ankle sprain. The most common complex ankle injuries were fracture, arthrosis, tendinitis, ACL rupture, and plantar fasciitis (Table 2).

Table 1. Characteristics of Respondents

No.	Characteristics	Frequency (n)	Percentage (%)
1.	Age		
	Adult (19 – 44 years)	98	79
	Pre-elderly (45 – 59 years)	26	21
	Total	124	100
2.	Gender		
	Male	65	52.4
	Female	59	47.6
	Total	124	100
3.	Occupation		
	Member of the Police Force	57	46
	Non-member of the Police Force	67	54
	Total	124	100
4.	Acute Ankle Sprain		
	Complex	54	43.5
	Simple	70	56.5
	Total	124	100

Table 2. Types of Comorbidities

No.	Types of Comorbidities	Frequency (n)	Percentage (%)
1.	Fracture	19	35.2
2.	Arthrosis	12	22.2
3.	Tendinitis	7	13
4.	ACL Rupture	6	11.1
5.	Plantar Fasciitis	5	9.3

Table 3. Relationship between Age and Acute Ankle Sprain

Age	Acute Ankle Sprain				Total	p value	OR	95% CI		
	Complex		Simple					Min	Max	
	n	%	n	%						
Adult (19 – 44 years)	40	40.8	58	59.2	98	100				
Pre-elderly (45 – 59 years)	14	53.9	12	46.1	26	100	0.333	0.591	0.248	1.411
Total	54	43.5	70	56.6	124	100				

The results of the relationship test between variables showed that the value of $p=0.333$ ($p>0.05$). There was no significant relationship between age and the incidence of acute ankle sprain. The Odd

Ratio (OR) value showed that adult age was 0.591 times more likely to experience acute ankle sprain compared to pre-elderly age (95% CI 0.248-1.411) (Table 3).

Table 4. Relationship between Gender and Acute Ankle Sprain

Gender	Acute Ankle Sprain				Total		p value	OR	95% CI	
	Complex		Simple		n	%			Min	Max
	n	%	n	%						
Male	29	44.6	36	55.4	65	100	0.944	1.096	0.538	2.231
Female	25	42.4	34	57.6	59	100				
Total	54	43.5	70	56.6	124	100				

The results of statistical calculations between gender and incidence of acute ankle sprain showed a value of $p=0.944$ ($p>0.05$). There was no significant relationship between gender and the incidence of acute ankle sprain. The Odd Ratio (OR) value shows that males are 1.096 times more likely to experience acute ankle sprain compared to females (95% CI 0.538-2.231) (Table 4).

Table 5. Relationship between Occupation and Acute Ankle Sprain

Occupation	Acute Ankle Sprain				Total		p value	OR	95% CI	
	Complex		Simple		n	%			Min	Max
	n	%	n	%						
Member of The Police Force	28	49.1	29	50.9	57	100	0.181	1.740	0.849	3.566
Non-member of The Police Force	26	38.8	41	61.2	67	100				
Total	54	43.5	70	56.6	124	100				

The results of the relationship test between variables showed that the value of $p=0.181$ ($p>0.05$). There was no significant relationship between occupation and the incidence of acute ankle sprain. The Odd Ratio (OR) value showed that members of the Police Force were 1.740 times more likely to experience acute ankle sprain compared to non-members of the Police (95% CI 0.849-3.566) (Table 5).

DISCUSSION

Ankle sprain can occur due to poor body balance. These factors are unique to each person depending on their physical condition. Another factor is strenuous physical activity which tends to be carried out by young adults. A person with poor physical condition and heavy physical activity may experience ankle sprain (Gribble et al., 2023). Younger age may increase the risk of ankle sprain (Azzahra & Supartono, 2021). In this study, there was no significant relationship between age and the incidence of acute ankle sprain. Research conducted by Elise (2017) on female soccer athletes, states that age has no significant relationship with the incidence of ankle sprain. Owoeye et al (2018) in line with this study, there is no significant relationship between age and the incidence of acute ankle sprain (Owoeye et al., 2018). This research is also in accordance with the research of Zulkarnain et al (2024) conducted on young adolescent athletes in Kediri. It was found that there was no significant difference in age with the incidence of ankle sprain.

The second risk factor is gender. Estrogen can increase collagen synthesis and change the structure of connective tissue. Estrogen may affect the ratio of type I and type III collagen. Type III collagen is more elastic, while type I is stronger. This imbalance can cause tendons and ligaments to become weaker and less able to bear weight (Inoue et al., 2023). This causes female at greater risk for ligament injuries (Raj et al., 2023). According to Wikstrom et al (2021), and Azzahra & Supartono (2021), and Fraser et al., (2021) that females have a higher risk of ankle sprain. Because there are differences in structure, musculoskeletal function, and physical fitness related to gender. However, this study is not in line with the research of Wikstrom et al (2021). This difference is due to the

Wikstrom et al (2021) used the systematic review method, while this study used the cross sectional method. Differences in research results were also found in the research of Fraser et al., (2021). It was found that female had a higher risk of ankle sprain in all occupational groups. Research by Fraser was conducted on military tactical athletes in the United States. These differences may occur due to differences in the population and location of the research site. This study found that male have a higher risk of acute complex ankle sprain than female. Male tend to have more explosive physical activity. Explosive activities involve fast movements and sudden changes in direction, which can put excessive stress on the ankle. Fast, explosive movements often do not allow enough time for the muscles and ligaments to prepare themselves to support the joint, increasing the risk of injury (Gosselin et al., 2019). Physical activities are often performed on uneven or slippery surfaces, which can increase the risk of falls or missteps. Thus, ankle sprain remains a potential risk. This study is in line with Faruhasa (2020) that there is no significant relationship between gender and the incidence of acute ankle sprain. The risk of ankle sprain is more related to the type and intensity of physical activity performed, physical condition, biomechanics, and history of injury.

In addition, occupation is an acute risk factor for ankle sprain. Ankle sprain is common in groups of people who participate in sports activities and in active military personnel (Herzog et al., 2019; Goodrich et al., 2022; Bulathsinhala et al., 2015). The level of risk factors in military personnel also varies by unit or rank. Ankle sprain can also occur due to the use of military footwear (Fraser et al., 2020). Therefore, the incidence of ankle sprain in police officers is more related to daily tasks and footwear use. Prolonged standing with improper footwear may be a risk factor for injury. This study found that police officers had a higher risk of acute complex ankle sprain compared to non-officers. However, there was no significant association between occupation and the incidence of acute ankle sprain. In this study, the majority of patients had acute simple ankle sprain. Ankle sprain can become chronic (Azzahra & Supartono, 2021). The patient's ankle joint becomes unstable. Thus, there is a decrease in the strength and flexibility of the leg muscles. This is what causes sufferers to experience complex ankle sprain (Herzog et al., 2019). Various injuries in complex ankle sprain such as strains, fractures, tendon ruptures or dislocations (Chaniotakis et al., 2023). The occurrence of complex ankle sprain can be influenced by a person's physical condition and the mechanism of injury. Thus, the results obtained are not very different between the two.

The implication of this study is to prevent at-risk groups and/or ankle sprain patients. Prevention can take the form of education or training. The police is quite risky for ankle injuries, so attention must be paid to muscle strength and stability in the foot. This can be overcome with a lot of practice and regular training (Chen et al., 2019; Marin et al., 2023). Hopefully, this can be improved in the future by providing adequate education and training for police officers.

CONCLUSION

The study concludes that age, gender, and occupation are not statistically significant in determining the risk of acute ankle sprains ($p > 0.05$). However, the Odds Ratios (ORs) indicate potential trends, especially for occupation (OR = 1.74, $p = 0.181$). While not statistically significant, these findings suggest a possible association that might be detected in a larger sample. The study could benefit from further exploration of Confidence Intervals (CIs). For instance, the wide CIs for occupation (0.849-3.566) indicate uncertainty, which should be acknowledged more explicitly. This can be overcome with a lot of strength training and proprioception exercises. In addition, officers can wear shoes that are appropriate in size and comfortable when used. The limitations of this study are the sample size, data on height, weight, and anatomical abnormalities of the patients were not fully available in the medical records. Future research should conduct a power analysis to determine the optimal sample size needed for detecting statistically significant differences. A larger sample might clarify whether the observed trends reach statistical significance. The data in this study are secondary data. Thus, the information generated does not fully reflect the current conditions. Future researchers are expected to conduct further research on other risk factors. Such as BMI, exercise habits, anatomical

abnormalities of patients, and the severity of ankle sprain through MRI results. In addition, research should be conducted using primary data to provide valid information.

CONFLICT OF INTEREST

There is no conflict of interest in this article.

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