Jurnal Kesehatan Islam
p-ISSN : 2303-002X
e-ISSN : 2615-8345
Volume 10 Nomor 2 Tahun 2021

Psoriasis Relationship with Hypertension in Psoriasis Patients at RSI Jemursari Surabaya

Retna Gumilang, Meidyta Sinantryana Widyaswari, Zakiyyatur Rizkiyyah Husin

Corresponding author:
retna.gumilang@unusa.ac.id
Faculty of Medicine,
Nahdlatul Ulama University
Surabaya

DOI

History Articel
Received:
Reviewed:
Accepted:
Published:

Keywords:
Skin diseases; cardiovascular diseases; hypertension

Abstract. Background*: Psoriasis is a chronic inflammatory disease of the skin that characterized by firmly bound erythema plaques covered in thick squama and caused by multiple abnormalities of genetic, biochemical, immunologic, vascular with further severed by various other factors such as psychology, drugs, smoking, and alcohol consumption. Several studies revealed that psoriasis can increase the risk of cardiovascular diseases such as hypertension, however, the underlying pathophysiological mechanism has not been confirmed yet. This mechanism is probably attributed to increased levels of angiotensin-converting enzyme produce angiotensin II that regulates vascular tonus, endothelin-1 (ET-1) has been considered an important role in that vasoconstrictor proteins are potent, and increased plasma renin activity has been reported in patients with psoriasis. Purpose: In order to figure out the relationship between psoriasis and hypertension in psoriasis patients at the Outpatient Unit -RSI Jemursari Surabaya.*
Methods*: This study was observational analytics with cross sectional study design in 28 psoriasis patients at Outpatient Unit-RSI Jemursari Surabaya during 2017-2019, using total sampling technique. Secondary data from medical records was collected and further analyzed with spearman correlation tests.*
Result*: The obtained significance value is 0.000 (p < 0.05), which represent a significant relationship between hypertension and psoriasis. the correlation coefficient is 0.757, which indicates the strength of a strong relationship between two variables.*
Conclusion*: There is a significant association between Psoriasis and Hypertension.*

Psoriasis is a chronic inflammatory disease of the skin that characterized by the presence of firmly bound erythema plaque covered in thick skuama (Pratiwi & Damayanti, 2018). Psoriasis is caused by multiple abnormalities of genetic, biochemical, immunology, vascular as well as exacerbated by various other factors such as psychology, drugs, smoke, and alcohol (Saurat et al., 2010). Psoriasis is a common disease in the world with 2-3% of the average prevalence value range of 0.09% to 11.43%. Approximately 100 million people in the world experience psoriasis according to this data (WHO, 2016). Meanwhile, the Indonesian psoriasis patients prevalence reaches 2.5% of the population and from such prevalence, there still many who have not received medical treatment (Sugito, 2008).

Several studies revealed that psoriasis may increase the risk of cardiovascular diseases such as hypertension (Cantika et al., 2012). The underlying pathophysiological mechanism has not yet been determined, but can be associated with elevated levels of angiotensin-converting enzyme, endothelin-1 (ET-1), and rennin. Adipose tissue as the main source of angiotensinogen, which is then converted into angiotensin II as a vascular tonus regulator (Armstrong et al., 2011). Endothelin-1 has been considered

an important role in that vasoconstrictor proteins are potent and produced by several different cell types, including keratinocytes (Salihbegovic et al., 2015).

A well known understanding of the impact and relation mechanism between psoriasis and increased risk of cardiovascular disease, especially hypertension, can help the therapies development that improve the prognosis of these two comorbid diseases.

METHODS

This research was observational analytics with cross sectional approach. The research was conducted at Jemursari Islamic Hospital Surabaya. Secondary data from the medical records of psoriasis patients was collected in June 2020. The research samples was selected from psoriasis patients that treated at Jemursari Islamic Hospital Surabaya in the period 2017 to 2019 with various criteria such as various types of psoriasis degrees, age > 14 years, and patient localization history.

The sample selection result obtained 28 patients who met the inclusion and exclusion criteria. The free variable in this study was psoriasis, while the bound variable was hypertension. Data management and analysis is performed using spss computer data processing program and Spearman's statistical test with significant value at less than α (α 0.05).

RESULTS

The research data sample was secondary data in the form of electronic medical record data of psoriasis patients that obtained from the medical record unit at RSI Jemursari Surabaya.

Table 1 Frequency Distribution of Blood Pressure Picture in Psoriasis Patients at RSI Jemursari Surabaya 2017-2019

Blood pressure category	Number of cases	Percentage
Normal	4	14,3
Prehypertensive	17	60,7
1st stage hypertension	5	17,9
2nd stage hypertension	2	7,1
Total	28	100,0

Source: Medical Record data at RSI Jemursari in 2017-2019.

Table 1 shows that 17 cases (60.7%) patients had blood pressure that included in prehypertension. Whereas, a small percentage of patients come into 1st stage hypertension category (17.9%), normal blood pressure (14.3%) and 2nd stage hypertension (7,1%).

Table 2 Frequency Distribution of PASI Score Degree (Score Psoriasis Area and Severity Index) in Psoriasis patients at RSI Jemursari Surabaya 2017-2019

PASI score degree	Number of cases	Percentage
low	19	60,7
moderate	5	25
height	4	14,3
Total	28	100

Source: RSI Jemursari Medical Record 2017-2019.

Table 2 shows that 19 cases (60.7%) of 28 cases is low PASI score degrees, while 5 cases (25%) is moderate degree patients, and only 4 cases (14.3%) is height PASI score degree.

Table 3 Hypertension Relationship with Psoriasis at RSI Jemursari Surabaya in 2017-2019

Blood pressure category	PASI score degree			Total number (precentage)
	low	moderate	height	
Normal	4	0	0	4 (14,3)
Prehypertension	15	1	1	7 (60,7)
1st stage hypertension	0	4	1	5 (17,9)
2nd stage hypertension	0	0	2	2 (7,1)
Total	19	5	4	100

Source: RSI Jemursari Medical Record 2017-2019.

Table 3 shows that the most cases is psoriasis with low degrees, each of the 4 cases had normal blood pressure and 15 cases with Pre-hypertension. For a small percentage of cases psoriasis is height degree, each of 1 case had Pre-hypertension category, 1 case had 1st stage hypertension category, and 2 patients belonged to the category of 2nd stage hypertension. The results of statistical tests using Spearman showed that the significance value obtained p 0.000, there is a significant relationship between psoriasis and hypertension. The Correlation Coefficient result is 0.757, indicating that there is a strong strength of the relationship between the two variables.

DISCUSSION

This study determined blood pressure into 4 categories; (a) normal category has less than 120 on systolic and less than on diastolic 80 mmHg blood pressure, (b) prehypertension category has 120-139/80-89 mmHg systolic/ diastolic blood pressure, (c) 1st stage hypertension has 140-159/90-99 mmHg systolic/diastolic blood pressure, (d) 2nd stage hypertension has ≥ 160/ ≥ 100 mmHg systolic/diastolic blood pressure. This study revealed that 14.3% patients had normal blood pressure category, 60.7% blood pressure patients had prehypertension category, 17.9% patients had 1st stage hypertension blood pressure category, and 7.1% patients had 2nd stage hypertension blood pressure category. Hence, most of the patients that become a research study subject suffering from prehypertension.

One of the techniques that used to measure psoriasis severity is Psoriasis Area and Severity Index (PASI) score (Permatasari, 2015). PASI score is a method to measure the severity of the disease. According to the Australian Government Therapeutic Goods Administration the severity of the disease is divided into 3 categories namely < 10 (low), 10-20 (moderate), > 20 (height). PASI score calculate the affected area with severity level of erythema, infiltration thickness, and skuama. This method is practical and fast, however, it has high intra-observer variability and little research focus on its validity and sensitivity.

This study show that 19 patients (60.7%) had low degree of psoriasis, 5 patients (25%) had moderate psoriasis, and 4 patients (14.3%) with height degree of psoriasis. However, the results of the study are different from the results of studies conducted by Budini et al., 2014 in 25 patients, obtained the severity of low disease found in 4 patients, moderately 10 patients and height 11 patients, where more patients with height degrees, than with psoriasis patients with low or moderate (Budini et al., 2014).

The results of this study was different with the research study which conducted by Budianti et al., 2019 most of the patients who came to polyclinics were included in severe psoriasis with a BSA/PASI score of > 10 which amounted to 15 people (47%). The number of patients with severe severity is more common because RSCM is a national tertiary referral service hospital that accepts referral patients from various primary and secondary services in Indonesia. Cases of psoriasis are low and moderate, more widely handled in primary and secondary services. Moderate degree psoriasis is the second most after height psoriasis, with a BSA/PASI score of 310, and a patient count of 9 people (28%), followed by low psoriasis with a BSA/PASI score of < 3% of 8 people (25%) (Budianti et al., 2019). Researchers argue that the possible difference in results is due to the level of research location services as a tertiary hospital so that patients who come to the hospital are patients with moderate-height symptoms.

The results of statistical tests using Spearman showed that the significance value obtained was 0.000 (p < 0.05) that refer to a significant relationship between Hypertension and Psoriasis. The Correlation Coefficient is 0.757, this suggests that hypertension and psoriasis have a strong relationship. Hypertension is determined according to psoriasis patients' blood pressure that recorded in the patient's medical record while psoriasis diagnosed by a specialist in skin and venereal diseases and recorded in patient's medical record data. This research study exhibit that heavier the psoriasis degree along with blood pressure increment. Furthermore, this research study result was accordance with Cohen et al. (2010) (11).

Budini (2014) conducted study about TNF-α skin lesions with the severity of psoriasis. It revealed that the higher the level of TNF-α skin lesions followed with the severity of the disease that determined with the correlation coefficient value of 0.587 with p = 0.002 (Budini et al., 2014). TNF-α was related to be hypertension in psoriasis, where in hypertension can caused hyperproliferation of keratinocytes in psoriasis TNF-α (Budini et al., 2014). Keratinocyte hyperproliferation produces endothelin-1, which further narrowing blood vessels and increasing blood pressure that can caused hypertension (Salihbegovic et al., 2015). Hence, the increasing TNF-α can caused blood pressure.

The exact pathophysiological mechanisms underlying psoriasis and hypertension are likely caused by adipose tissue in psoriasis patients that serves as the primary source of angiotensinogen, which is then converted into angiotensin II. Angiotensin II can increase salt retention by the kidneys, and may also stimulate the proliferation of T-cells (Armstrong et al., 2011). Angiotensin II, a product of angiotensin-converting enzyme (ACE) that regulates vascular tonus and stimulates the release of pro-inflammatory cytokines. Increased plasma renin activity has been reported in patients with psoriasis. The relationship between psoriasis and hypertension can also be associated with endothelin-1 production, which is produced by keratinocytes as an autocrine growth factor (Cohen et al., 2010). Bonifati et al., (2007) reported that endothelin-1 increased in sera skin and lesions of psoriasis patients, compared to control. Endothelin-1 levels correlated with the severity of psoriasis (Bonifati & Berardesca, 2007). Endothelin-1 is a potent vasoconstrictor and can cause hypertension in psoriasis patients.

The pathophysiological mechanisms on psoriasis and hypertension were probably caused by adipose tissue in psoriasis patients. Adipose tissue is the primary source of angiotensinogen, that further converted into angiotensin II.

Angiotensin II not only increases salt retention in kidneys but also stimulates T-cells proliferation (Armstrong et al., 2011). Angiotensin II is an angiotensin-converting enzyme (ACE) product that controls blood vascular tone and stimulates pro-inflammatory cytokines release. the observation on psoriasis patients showed that plasma renin activity was increased. Psoriasis and hypertension were associated with endothelial-1 production which is produced by keratinocytes as an autocrine growth factor (Cohen et al., 2010). Bonifati et al., (2007) reported that endothelin-1 was increased in sera skin and lesions in psoriasis patients compared to control. Endothelin-1 levels were correlated with psoriasis severity (Bonifati & Berardesca, 2007). Endothelin-1 is a potent vasoconstrictor and hypertension causes in psoriasis patients.

This research result was align with Cohen et.al (2010) that exhibit endothelin-1 levels has correlation with psoriasis the severity of. Endothelin-1 is a potent vasoconstrictor and hypertension causes in psoriasis patients. Therefore, the endothelin-1 increment along with blood pressure. This study results revealed that psoriasis severity was increased with blood pressure in psoriasis patients.

CONCLUSION

The results of the study conducted at RSI Jemursari Surabaya using research data as many as 28 medical records of psoriasis patients in 2017-2019 were concluded that there is a significant relationship between psoriasis and hypertension, with the strength of a strong relationship. Cardiovascular disease has been widely proven to be one of the comorbidities in psoriasis that needs to be considered. Various studies have shown an association of inflammatory processes in the pathogenesis of these two diseases. Every clinician needs to be aware and provide therapy for comorbid diseases. Patients also need to be educated to increase physical activity and reduce alcohol and cigarette consumption.

REFERENCES

Armstrong, A. W., Lin, S. W., Chambers, C. J., Sockolov, M. E., & Chin, D. L. 2011. Psoriasis and Hypertension Severity: Results from a Case-control Study. PLoS ONE, 6(3), 1–5. https://doi.org/10.1371/journal.pone.0018227

Bonifati, C., & Berardesca, E. 2007. Clinical Outcome Measures of Psoriasis. Reumatismo, 59(SUPPL. 1), 64–67. https://doi.org/10.4081/reumatismo.2007.1s.64

Budianti, W. K., Anindya, S., Debinta, A. A., Novianto, E., Fitri, E. M., & Halim, E. 2019. KesesuaianTata Laksana Psoriasis Dengan Panduan Praktik Klinis (PPK) di RSUPN DR. Cipto Mangunkusumo. Media Dermato Venereologica Indonesiana, 46(4), 1–10. https://www.ojs.perdoski.id/index.php/mdvi/article/view/77

Budini, S. S., Cholis, M., & Rofiq, A. 2014. TNF-Alpha Level in Skin Lesion with Severity Scale of Psoriasis Vulgaris. Berkala Ilmu

Kesehatan Kulit & Kelamin, 26(1), 22–28. https://e-journal.unair.ac.id/BIKK/article/view/1509

Cantika, A. S., Himbawani, M., & Sudaryanto. 2012. Hubungan Derajat Keparahan Psoriasis Vulgaris Terhadap Kualitas Hidup Penderita. Jurnal Media Medika Muda, 1(1), 1–17. https://media.neliti.com/media/publications/112105-ID-hubungan-derajat-keparahan-psoriasis-vul.pdf

Cohen, A. D., Weitzman, D., & Dreiher, J. 2010. Psoriasis and Hypertension: A Case-control Study. Acta Dermato-Venereologica, 90(1), 23–26. https://doi.org/10.2340/00015555-0741

Permatasari, D. W. 2015. Serum Prolactin Levels in Psoriasis Vulgaris with Score Psoriasis Area and Severity Index. Agromed Unila, 2(4), 397–401. https://juke.kedokteran.unila.ac.id/index.php/agro/article/view/1224/pdf

Pratiwi, K. D., & Damayanti. 2018. Psoriasis Vulgaris In RSUD Dr . Soetomo Surabaya : A Retrospective Study. Periodical of Dermatology and Venereology, 30(3), 248–254. https://e-journal.unair.ac.id/BIKK/article/view/8628/pdf

Salihbegovic, E. M., Hadzigrahic, N., Suljagic, E., Kurtalic, N., Sadic, S., Zejcirovic, A., & Mujacic, A. 2015. Psoriasis and High Blood Pressure. BiblioMed, 69(1), 13–15. https://doi.org/10.5455/medarh.2015.69.13-15

Saurat, J. H., Guérin, A., Yu, A. P., Latremouille-Viau, D., Wu, E. Q., Gupta, S. R., Bao, Y., & Mulani, P. M. 2010. High Prevalence of Potential Drug-Drug Interactions for Psoriasis Patients Prescribed Methotrexate or Cyclosporine for Psoriasis: Associated Clinical and Economic Outcomes in Real-World Practice. Dermatology, 220(2), 128–137. https://doi.org/10.1159/000275198

Sugito, T. L. 2008. Penyakit Papuloeritroskuamosa dan Dermatomikosis Superfisialis pada Bayi dan Anak. Badan Penerbit Universitas Diponegoro Semarang.

WHO. 201). Global Report on Psoriasis. In Global Report on Psoriasis (Vol. 978). http://apps.who.int/iris/bitstream/handle/10665/204417/9789241565189_eng.pdf;jsessionid=86E88859CDB917C3B6C76C65A075BA87?sequence=1