

Profile of Serum Folate Levels in Various Severity Degrees of Psoriasis Vulgaris Patients at Murni Teguh Memorial Hospital Medan

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Psoriasis vulgaris is a chronic inflammatory disease characterized by keratinocyte proliferation and excessive immune system activation. Folic acid plays a role in DNA synthesis and cell division processes. Keratinocyte hyperproliferation in psoriasis can affect serum folic acid levels, but previous studies have shown varying results. The aim of this study was to determine the serum folic acid level profile in patients with various degrees of psoriasis vulgaris severity at Murni Teguh Memorial Hospital in Medan. This was a cross-sectional study with a sample size of 11 respondents at Murni Teguh Memorial Hospital in Medan. The results showed that the majority of respondents were in the early-to-late adulthood age group (54.5%) with an average serum folate level of 9.1 ng/mL. Based on gender, the majority of respondents were female (63.6%) with an average serum folate level of 9.5 ng/mL. Based on the severity of vulgaris psoriasis, most respondents were in the mild category (72.7%) with an average serum folic acid level of 9 ng/mL, while those in the moderate category (27.3%) had an average level of 8 ng/mL. It can be concluded that all respondents (100%) in this study had serum folic acid levels in the normal range.

Keywords: Psoriasis vulgaris, folic acid serum level

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1. Introduction

Psoriasis vulgaris is a chronic inflammatory and autoimmune skin disease characterized by reddish plaques covered by silvery-white scales. The mechanism of psoriasis is caused by impaired cellular function, specifically excessive keratinocyte proliferation and immune system activation, which disrupts the regulation of keratinocyte turnover and forms thick, scaly plaques on the skin. In 2019, approximately 4.6 million psoriasis cases were recorded globally, including 1.9 million cases in Asia and 34,475 cases in Indonesia. Although specific data on the number of psoriasis cases in North Sumatra has not been documented, an incidence of 64 psoriasis cases was reported at Martha Friska Multatuli Hospital from January to December 2022.

The severity of psoriasis is evaluated using the Psoriasis Area and Severity Index (PASI), which assesses erythema, infiltration, desquamation, and lesion area. Excessive keratinocyte proliferation leads to increased DNA synthesis. As DNA synthesis increases, the demand for folic acid during DNA processing also rises. Folic acid (vitamin B9) plays an essential role in cell formation, cell division, and DNA synthesis in the body; thus, folic acid requirements can be influenced by keratinocyte hyperproliferation in psoriasis patients.

Several studies state that a decrease in serum folic acid levels occurs in psoriasis patients, particularly in severe grades. However, other studies indicate no relationship between folic acid levels and psoriasis

severity. These differing results demonstrate that the association between serum folic acid levels and psoriasis remains inconsistent and requires further investigation.

Currently, there is no data regarding the profile of serum folic acid levels in relation to the severity of psoriasis vulgaris at Murni Teguh Memorial Hospital Medan. Therefore, the objective of this study was to determine the profile of serum folic acid levels across various severity degrees of psoriasis vulgaris patients at Murni Teguh Memorial Hospital Medan.

2. Methods

This study was a descriptive study utilizing a cross-sectional design. The research was conducted in November 2025 at Murni Teguh Memorial Hospital Medan. The target population consisted of psoriasis patients, and the accessible population comprised psoriasis vulgaris patients at Murni Teguh Memorial Hospital Medan in November 2025. The sample consisted of 11 respondents selected using a total sampling technique based on inclusion criteria. The primary material evaluated was serum folic acid testing. Venous blood samples of approximately 3 mL were drawn aseptically and centrifuged to obtain serum. Folic acid concentration measurements were performed according to standard laboratory procedures and expressed in units of ng/mL, with a reference range of 3–20 ng/mL.

The independent variable in this study was the serum folic acid level, while the dependent variable was the severity degree of psoriasis vulgaris. Data analysis was performed descriptively using computer software. Univariate data analysis to assess the profile of serum folic acid levels across various severity degrees of psoriasis vulgaris patients was presented in the form of frequency distribution tables and percentages.

3. Results

Based on Table 1, it can be observed that the majority of respondents belonged to the early-to-late adulthood group aged 26–45 years, totaling 6 individuals (54.5%). Most respondents were female, accounting for 7 individuals (63.6%). Regarding education levels, the majority held a higher education degree (university level), totaling 8 individuals (72.7%). In terms of occupation, most respondents worked in the private sector, totaling 6 individuals (54.5%).

Table 1. Distribution of Characteristics of Psoriasis Vulgaris Respondents

Characteristic	Frequency (n)	Percentage (%)
Age Group		
Early adolescent – late adolescent (12 – 25 years)	1	9.1
Early adult – late adult (26 – 45 years)	6	54.5
Middle age – early elderly (46 – 65 years)	4	36.4
Elderly (>65 years)	0	0
Total Age	11	100
Gender		
Male	4	36.4
Female	7	63.6
Total Gender	11	100
Education Level		
No Schooling	0	0
Elementary School	0	0
Junior High School	1	9.1

Characteristic	Frequency (n)	Percentage (%)
Senior High School	2	18.2
Higher Education (University)	8	72.7
Total Education	11	100
Occupation		
Unemployed	0	0
Student	1	9.1
Civil Servant	3	27.3
Private Sector	6	54.5
Others	1	9.1
Total Occupation	11	100

Based on Table 2, the majority distribution of disease duration in psoriasis patients was more than 10 years, totaling 5 individuals (45.5%). Respondents with a duration of 1–5 years totaled 2 individuals (18.2%), those with a duration of 6–10 years totaled 4 individuals (36.4%), and those with a duration of >10 years totaled 5 individuals (45.5%).

Table 2. Distribution of Disease Duration of Psoriasis Vulgaris

Duration of Psoriasis Vulgaris	Frequency (n)	Percentage (%)
< 1 year	0	0
1 – 5 years	2	18.2
6 – 10 years	4	36.4
> 10 years	5	45.5
Total	11	100

Based on Table 3, the majority distribution of severity degrees among psoriasis vulgaris respondents was in the mild category, totaling 8 individuals (72.7%). Respondents with moderate severity totaled 3 individuals (27.3%).

Table 3. Distribution of Psoriasis Vulgaris Severity Degrees

Severity Degree of Psoriasis Vulgaris	Frequency (n)	Percentage (%)
Mild	8	72.7
Moderate	3	27.3
Severe	0	0
Total	11	100

Based on Table 4, the distribution of serum folic acid levels by age group indicates that all respondents had serum folic acid levels in the normal category (100%). In the early adolescent – late adolescent group (12–25 years), there was 1 respondent with normal serum folic acid (9.1%). In the early adult – late adult group (26–45 years), there were 6 respondents with normal folic acid levels (54.5%). In the middle age – early elderly group (46–65 years), there were 4 respondents with normal folic acid levels (36.4%).

Table 4. Distribution of Serum Folic Acid Levels Based on Age

Age Group (years)	Low n (%)	Normal n (%)	High n (%)
Early adolescent – late adolescent (12 – 25 years)	0 (0)	1 (9.1)	0 (0)
Early adult – late adult (26 – 45 years)	0 (0)	6 (54.5)	0 (0)
Middle age – early elderly (46 – 65 years)	0 (0)	4 (36.4)	0 (0)
Elderly (>65 years)	0 (0)	0 (0)	0 (0)
Total	0 (0)	11 (100)	0 (0)

Based on Table 5, the distribution of serum folic acid levels based on gender showed that both male and female respondents had serum folic acid levels within the normal category (100%). Among male respondents, 4 individuals had normal serum folic acid levels (36.4%), and among female respondents, 7 individuals had normal serum folic acid levels (63.6%).

Table 5. Distribution of Serum Folic Acid Levels Based on Gender

Gender	Low n (%)	Normal n (%)	High n (%)
Male	0 (0)	4 (36.4)	0 (0)
Female	0 (0)	7 (63.6)	0 (0)
Total	0 (0)	11 (100)	0 (0)

Based on Table 6, the distribution of serum folic acid levels by severity degree demonstrated that all respondents (100%) maintained normal serum folic acid levels. Among respondents with mild severity, 8 individuals had normal serum folic acid levels (72.7%), while among those with moderate severity, 3 individuals had normal serum folic acid levels (27.3%).

Table 6. Distribution of Serum Folic Acid Levels Based on Severity Degree

Severity Degree	Low n (%)	Normal n (%)	High n (%)
Mild	0 (0)	8 (72.7)	0 (0)
Moderate	0 (0)	3 (27.3)	0 (0)
Severe	0 (0)	0 (0)	0 (0)
Total	0 (0)	11 (100)	0 (0)

Discussion

From Table 1, it was found that the majority of respondents were in the early-to-late adult age group ranging from 26 to 45 years old (54.5%). The high incidence of psoriasis in adults is attributed to stress factors related to work, daily activities, and family, which can disrupt cortisol release regulation. This imbalance can lead to the uncontrolled release of pro-inflammatory cytokines and increase the incidence of psoriasis. The majority of respondents were female, totaling 7 individuals (63.6%). A higher incidence of psoriasis in women can be caused by unstable hormonal factors, such as fluctuating estrogen and progesterone levels. This fluctuation influences the release of pro-inflammatory cytokines, thereby increasing the risk of keratinocyte hyperproliferation in the skin, which serves as the underlying mechanism of psoriasis vulgaris. Psychosocial stress can also act as a trigger for psoriasis and is most commonly experienced by women. Furthermore, most respondents had completed higher education (university degree), totaling 8 individuals (72.7%). Psoriasis patients with higher education tend to pay closer attention to their health conditions and generally have better access to healthcare services. Additionally, most respondents worked in the private sector, totaling 6 individuals (54.5%). Psoriasis patients working under stress—such as pressure from superiors or career challenges—are prone to psoriasis flares. Emotional factors like shame, anger, and low self-esteem caused by their disease condition impose a psychological burden when working in their environment, where stress triggers inflammation and worsens psoriasis.

From Table 2, it was found that 5 respondents (45.5%) had suffered from the disease for >10 years at Murni Teguh Memorial Hospital Medan. Psoriasis is a chronic, relapsing disease that can persist for years. The older a psoriasis patient is, the longer the duration of their psoriasis condition tends to be.

From Table 3, 8 respondents (72.7%) presented with a mild severity of psoriasis at Murni Teguh Memorial Hospital Medan. A mild severity grade is more commonly encountered compared to moderate or severe cases in the general population of psoriasis patients. The severity grade of psoriasis can be determined

using the PASI (Psoriasis Area and Severity Index) score through clinical examination evaluating erythema, induration, and desquamation on the patient's body.

From Table 4, all 11 respondents (100%) had normal serum folic acid levels, consisting of 6 respondents (54.5%) in the early-to-late adult age group (mean value: 9.1 ng/mL), 4 respondents (36.4%) in the middle age to early elderly group (mean value: 7.9 ng/mL), and 1 respondent (9.1%) in the early-to-late adolescent group (serum folic acid level: 9.7 ng/mL) at Murni Teguh Memorial Hospital Medan. Folic acid levels in psoriasis patients showed no significant difference compared to non-psoriasis populations within the adult age group. In this study, patients undergoing methotrexate treatment were excluded under the exclusion criteria, resulting in normal serum folic acid levels across all 11 study respondents. Adequate dietary intake of folic acid, such as green leafy vegetables and fruits, also plays a role in maintaining serum folic acid levels in patients with psoriasis vulgaris.

From Table 5, all 11 respondents (100%) presented normal serum folic acid levels, consisting of 7 female respondents (63.6%) (mean value: 9.5 ng/mL) and 4 male respondents (36.4%) (mean value: 7.3 ng/mL) at Murni Teguh Memorial Hospital Medan. Both male and female respondents had normal serum folic acid levels within the 3–20 ng/mL range. Changes in serum folic acid levels in psoriasis patients are influenced by the disease mechanism, namely excessive keratinocyte proliferation and small intestinal mucosal inflammation, which can cause folic acid malabsorption.

From Table 6, all 11 respondents (100%) showed normal serum folic acid levels, comprising 8 individuals (72.7%) with mild severity (mean value: 9 ng/mL) and 3 individuals (27.3%) with moderate severity (mean value: 8 ng/mL) at Murni Teguh Memorial Hospital Medan. In psoriasis patients, excessive turnover of keratinocytes leads to excessive consumption of folic acid utilized for DNA methylation, thereby decreasing folic acid levels in the body. However, dietary intake of foods containing folic acid, such as green vegetables, fruits, red meat, eggs, and dairy products, can fulfill the body's folic acid nutritional requirements.

4. Conclusion

Based on the results of this study, it can be concluded that the serum folic acid levels of all respondents with psoriasis vulgaris across mild severity (mean value: 9 ng/mL) and moderate severity (mean value: 8 ng/mL) were within the normal range.

5. References

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