

# High rate of smoking in female patients with Mondor's disease in an outpatient clinic in Japan

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**Purpose:** Little is known about the epidemiology of Mondor's disease. The aim of this study was to analyze the clinical features of Mondor's disease in an outpatient clinic where primary care physicians are working in Japan, to better understand the epidemiological characteristics of the disease.

**Patients and methods:** The data for consecutive outpatients who were new visitors to the Department of General Medicine in the teaching hospital (Asahikawa Medical University Hospital) at Asahikawa Medical University, Asahikawa, Hokkaido, Japan, between April 2004 and March 2012 were analyzed. Parameters such as age, sex, diagnosis, and clinical presentation were investigated.

**Results:** During the 8-year period covered in this study, six (0.07%) out of 8767 patients were diagnosed as having Mondor's disease. All of these patients with Mondor's disease were female, and the mean age was 41 plus or minus 12 years; the overall rate of Mondor's disease in all female patients involved in this study was 0.12%. The patients complained of pain and a cord-like structure in the anterolateral thoracoabdominal wall. The painful mass had persisted for 1–4 weeks before presenting at the Department of General Medicine and it disappeared within a couple of weeks. Current smoking was significantly higher in the patients with Mondor's disease than in the age-matched female patients without Mondor's disease who were also evaluated in this study.

**Conclusion:** These results suggest that a high rate of smoking in middle-aged females may be a characteristic feature of Mondor's disease. These epidemiological data may be useful in detection of the disease in the primary care setting in Japan.

**Keywords:** primary care, epidemiology, current smoking, women

## Introduction

Mondor's disease is a rare benign clinical entity characterized by thrombophlebitis of the superficial veins of the anterolateral thoracoabdominal wall.<sup>1</sup> Anatomically, the affected veins include the lateral thoracic, thoracoepigastric, and superior epigastric veins.<sup>2</sup> This condition was first described by Faage<sup>3</sup> in 1869 and was subsequently characterized by the French surgeon Henry Mondor<sup>4</sup> in 1939. However, the clinical characteristics, including the epidemiological data of the disease, have not been fully clarified because of a lack of awareness of the entity. Both the etiology and the pathogenesis of this condition are still not clear. Risk factors cited for the development of the condition have included breast surgery, breast biopsy, an inflammatory process, breast cancer, and trauma.<sup>5–7</sup>

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There have been several studies regarding the incidence of Mondor's disease of the breast. Salemis et al<sup>8</sup> reported that five cases of Mondor's disease (0.08%) were identified from 5717 breast examinations performed over a 3-year period at the Breast Cancer Surgery Unit of the Army General Hospital, Athens, Greece, indicating the rate of Mondor's disease was lower than 0.1%. Clegg-Lamprey et al<sup>9</sup> reported that in a breast clinic in Ghana, seven cases of Mondor's disease (0.94%) were identified among the 748 patients who visited the clinic. Hou et al<sup>6</sup> reported that 84 cases of Mondor's disease (0.87%) were identified among 9657 new patients in the breast clinic of Kaohsiung Medical University Hospital in Kaohsiung, Taiwan, Republic of China, over a period of 6 years. Thus, the rate of Mondor's disease ranged from 0.08% to 0.94% in breast clinics in Greece, Ghana, and China, suggesting there may be a regional difference in the prevalence of Mondor's disease.

Although several reports have investigated the incidence of Mondor's disease in breast clinics, the prevalence of the disease is still not well known. As patients with Mondor's disease usually present with a painful cord-like structure in the breast, patients are often afraid of having a malignancy in the breast. However, Mondor's disease is usually a benign, self-limited condition.<sup>8</sup> Therefore, it is important for general practitioners to understand the clinical characteristics of Mondor's disease in addition to being able to diagnose the disease accurately. Based on the evidence outlined thus far, the present study was performed to clarify the epidemiological characteristics of Mondor's disease in a clinic where primary care physicians are working in Japan.

## Methods

The authors analyzed consecutive outpatients who were new visitors to the Department of General Medicine in the teaching hospital (Asahikawa Medical University Hospital) at Asahikawa Medical University, Asahikawa, Hokkaido, Japan, between April 2004 and March 2012. As the authors have recently discussed,<sup>10–13</sup> the hospital, which has 602 beds,

has approximately 250 doctors who together work to cover almost all medical problems. Of these doctors, four or five primary care physicians work in the Department of General Medicine. For this study, all data were drawn from medical records and the computerized physician order entry system used in the hospital, and parameters such as age, sex, and clinical presentation were investigated. Mondor's disease of the breast was diagnosed if a palpable cord-like structure associated with pain was identified in the anterolateral thoracoabdominal wall.

## Statistical analysis

Statistical analysis was performed by Fisher's exact test using SPSS (v 19; IBM Corporation, Armonk, NY). A *P*-value of <0.05 was considered statistically significant.

## Results

Mondor's disease was diagnosed in six (0.07%) of the 8767 patients in this study. Table 1 shows the clinical characteristics of these six patients – all six patients were females, and the mean age at diagnosis was 41 plus or minus 12 years. All patients had suffered from a palpable cord-like structure associated with pain in the anterolateral thoracoabdominal wall. The symptoms had persisted for 1–4 weeks in either the right or the left side at the initial visit, and the symptoms resolved within a couple of weeks. In all six patients, no abnormal findings were observed in body temperature, body mass index, blood pressure, or routine laboratory data, including white blood cell count and C-reactive protein. A previous rib fracture on the ipsilateral side (Table 1, Case 3) and an operation for ipsilateral breast cancer (Table 1, Case 5) were considered to be possible causes of the Mondor's disease. As shown in Tables 1 and 2, five (83.3%) of the six patients were smokers. The one nonsmoking patient (Table 1, Case 2) was not exposed to indirect smoking. To examine whether the rate of smoking is higher in patients with Mondor's disease than in similar patients without the disease, the rate of smoking was investigated in the age-matched female patients

**Table 1** Clinical characteristics of six patients with Mondor's disease

Case	Age (years)	Sex	Symptom duration (weeks)	Symptoms (R/L)	Possible cause	Brinkman index score
1	30	F	1	L	–	100
2	44	F	4	R	–	0
3	61	F	1	L	Rib fracture (L)	200
4	28	F	3	R	–	80
5	44	F	2	R	Breast cancer (R)	150
6	39	F	2	L	–	280

**Abbreviations:** R, right; L, left; F, female.

**Table 2** Smoking in female patients between 20 and 69 years of age

Diagnosis	Patients (n)	Smokers [n (%)]	Nonsmokers [n (%)]
Mondor's disease	6	5 (83.3)*	1 (16.7)
Other	3604	885 (24.6)	2719 (75.4)

Note: \*P < 0.01, compared with "Other" group.

without Mondor's disease who were also evaluated in this study. Medical information on smoking was obtained for 3610 of the 3852 female patients in this study aged between 20 and 69 years, including the six patients with Mondor's disease. Of the 3604 patients in this study with a diagnosis other than Mondor's disease, 885 patients had smoked and 2719 patients had never smoked. A statistical evaluation by Fisher's exact test revealed a significantly higher rate of smoking in patients with Mondor's disease than in the other patients analyzed in this study (Table 2).

Table 3 shows the distribution of age and sex in patients with Mondor's disease in this study. The overall rate of Mondor's disease in all female patients involved in this study was 0.12%, while the rate was 0% in males. Mondor's disease was not seen in elderly patients.

## Discussion

To date, a population-based study of Mondor's disease of the breast has not been reported. In addition, the rate of

Mondor's disease in the primary care setting has not been shown previously, although a few studies have demonstrated the incidence of Mondor's disease in breast clinics in Greece, Ghana, and China.<sup>6,8,9</sup> Therefore, to the best of the authors' knowledge, the present study is the first time that the overall incidence of Mondor's disease (0.07% in all patients and 0.12% in all female patients involved in this study) has been reported in the primary care setting in Japan.

With regard to the gender difference in Mondor's disease, Catania et al<sup>5</sup> reported that in a study of 63 patients with Mondor's disease, six patients were male; Bejanga<sup>7</sup> reported a study of 28 female and two male patients with Mondor's disease; and Farrow<sup>14</sup> reported a study involving 42 female patients and only one male patient with Mondor's disease. Thus, Mondor's disease is considered to have a clear gender difference. In agreement with this, the present study found six female and no male patients were diagnosed with Mondor's disease.

Although bilateral lesions of Mondor's disease have been reported in patients,<sup>2,15,16</sup> the large majority of patients with Mondor's disease present unilaterally in either the right or the left side.<sup>17</sup> In the present study, Mondor's disease was observed unilaterally in all six patients.

Risk factors considered for the pathogenesis of Mondor's disease have included breast surgery, breast biopsy, an inflammatory process, breast cancer, and trauma.<sup>5,6</sup> In the present study, breast cancer was considered to be a possible factor involved in the pathogenesis of Mondor's disease in one patient. The ipsilateral lesion of Mondor's disease developed after an operation for breast cancer, strongly suggesting an association (Table 1, Case 5); however, other factors including smoking could not be ruled out. Hogan<sup>15</sup> has postulated that direct trauma to the vein or pressure on the lateral thoracic veins leading to stasis of blood may be the pathophysiologic cause. Therefore, a previous rib fracture on the ipsilateral side may have been a possible factor involved in the pathogenesis of Mondor's disease in one of the cases in this study (Table 1, Case 3).

Little is known about the relationship between smoking and Mondor's disease. Results of the present study demonstrated a significantly higher rate of smoking in patients with Mondor's disease than in the age-matched female patients without Mondor's disease who were also evaluated. These results suggest for the first time that smoking may be a factor involved in the pathogenesis of Mondor's disease. As smoking is one of the factors that induce coagulatory processes<sup>18–20</sup> and Mondor's disease is characterized by thrombophlebitis of the veins, this may be a reasonable hypothesis.

**Table 3** Age and gender distribution of patients with Mondor's disease

Sex	Age group (years)	Patients (n)	Mondor's disease [n (%)]
Male	0–9	47	0 (0)
	10–19	227	0 (0)
	20–29	567	0 (0)
	30–39	614	0 (0)
	40–49	403	0 (0)
	50–59	495	0 (0)
	60–69	546	0 (0)
	70–79	476	0 (0)
	80–89	213	0 (0)
Subtotal	–	3588	0 (0)
Female	0–9	23	0 (0)
	10–19	283	0 (0)
	20–29	864	1 (0.12)
	30–39	890	2 (0.22)
	40–49	585	2 (0.34)
	50–59	720	0 (0)
	60–69	793	1 (0.13)
	70–79	680	0 (0)
	80–89	341	0 (0)
Subtotal	–	5179	6 (0.12)
Total	–	8767	6 (0.07)

A limitation of this study is the small sample size. A larger examination should be performed to confirm these findings.

## Conclusion

The present study revealed that the overall incidence of Mondor's disease was 0.07% over a period of 8 years in a clinic where primary care physicians are working in Japan. All patients with Mondor's disease were female, and smoking was found to potentially be a factor involved in the pathogenesis of Mondor's disease. These epidemiological data may help medical professionals understand this clinical entity in the primary care setting in Japan.

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## Disclosure

The authors report no conflicts of interest in this work.

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