

Clinical features and aggravating factors in nummular eczema in Thais

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Summary

Background: Nummular eczema is an idiopathic inflammatory skin disease that mostly has a chronic and relapsing course. Many factors are thought to be responsible for this condition, such as atopic dermatitis, dry skin, emotional stress or seasonal variation.

Objective: The purpose of the study was to assess clinical findings and aggravating factors of nummular eczema and to evaluate characteristics, severity of disease and quality of life of patients.

Methods: One hundred patients aged from 18 years old diagnosed as nummular eczema were asked about general data, characteristics and clinical findings of nummular eczema, and completed the Thai version of the Dermatology Life Quality Index (DLQI) questionnaires. They also underwent a physical examination.

Results: Mean (SD) age was 42.1 (18.4) years and two-thirds were women. Fourteen percent had history of atopic dermatitis and half had history of atopy or contact dermatitis. From patch tests, the most common allergen was found to be nickel. Ninety percent of lesions located in lower extremities and two-thirds had a co-existing dryness of the skin. Emotional stress and drinking alcohol aggravated the disease. Those who had exacerbation in summer or skin dryness tended to have persisting disease.

Mean(SD) total DLQI score among our patients was 9.2(6.8). Quality of life of the patients was significantly impaired in younger life, office workers, those with trunk-distributed lesions and those having extensive lesions.

Conclusions: Clinical features and possible aggravating factors of nummular eczema were reported. The result confirmed the chronic course of the disease. The nummular eczema affected quality of life of patients and itching caused the most impairment. (*Asian Pac J Allergy Immunol 2012;31:36-42*)

Key words: nummular eczema, clinical features, aggravating factors, Dermatology Life Quality Index (DLQI), quality of life

Introduction

Nummular eczema is an idiopathic inflammatory skin disease that is characterised by multiple coin-shaped eczematous lesions, most commonly affecting the extremities and trunk.¹ Nummular eczema is the clinical terminology. It is important to rule out diseases that have a similar pattern, such as guttate psoriasis, dermatophytosis, allergic contact dermatitis, atopic dermatitis and stasis dermatitis.

The cause of nummular eczema is unknown.² Many factors have been proposed as aetiological factors. The internal factors are dry skin, emotional stress, stasis and the manifestation of atopic dermatitis in children.^{1,3-5} The external factors may also play a role such as auto-eczematisation from allergens or *Staphylococcus*, seasonal variation, alcohol and drugs. The allergens commonly implicated were rubber chemicals, formaldehyde, neomycin, chrome and nickel, as well as mercury in dental amalgam.^{6,7} Positive patch tests to the allergen *Dermatophagoides farinae* and the house dust allergen were reported in elderly patients with nummular eczema.⁸ Staphylococci and micrococcus may be the direct cause or induce hypersensitivity reactions.⁹ Seasonal variation may also affect patients, as they have a peak frequency of lesions in the winter when the hydration state is low, which makes the stratum corneum become drier than

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usual.^{8,10} Summer may also worsen the lesions predominantly in men.¹⁰ Nummular eczema was related to alcohol excess and associated with abnormal liver function tests.¹¹ Oral systemic drugs were shown to relate to nummular eczema, such as gold and isotretinoin.^{12,13} Routine laboratory tests usually showed no abnormalities. The patch test should be considered for patients with severe or persistent disease.¹⁴

The treatments involve applying emollients to hydrate skin and apply topical anti-inflammatory agents include glucocorticoids, tacrolimus or pimecrolimus to treat the lesions.¹⁵ Systemic glucocorticoids should be obtained in severe or refractory cases.¹⁵ Methotrexate showed efficacy in children with nummular eczema.¹⁶ The pruritus can be relieved by antihistamine.¹⁵

Nummular eczema is usually a chronic disease. The lesions commonly relapse after occasional remission or may persist for long periods. In one series, patients were followed up to two years; 22 percent were dermatitis-free, 25 percent had had lesion-free periods ranging from weeks to years, and 53 percent had never been free of dermatitis, except when using local therapy.¹⁰

Because of the chronic course and some patients being refractory cases, they might influence the psychological state, social relationships and everyday activities. Therefore, we used the Dermatology Life Quality Index (DLQI) questionnaire to evaluate the impact of nummular eczema on patients' lives. DLQI questionnaires were 10-item, self-administered English language questionnaires developed by Finlay and Khan to measure the effects of different skin disorders on the quality of the patient's life. The Thai version of the DLQI questionnaires had been formally translated and tested by Kulthanan et al., and showed high validity and reliability.¹⁷

The purpose of the study was to assess clinical findings and aggravating factors of nummular eczema and to evaluate characteristics, severity of the disease and quality of life of the patients.

Methods

The study was a single centre, cross-sectional study. A total of 100 consecutive patients with nummular eczema who attended the outpatient dermatology clinic at Siriraj Hospital, Mahidol University, Bangkok, Thailand between May 2005 and June 2006 were enrolled into this study. This

study had been approved by the Ethical Committee of the hospital.

All patients aged from 18 years old and diagnosed by dermatologists as having nummular eczema were included in the study. They were asked to give written informed consent before the interview. Exclusion criteria included the patients who declined to sign the informed consent or could not read and fill in the DLQI questionnaires by themselves.

All patients were interviewed and examined by the doctor (CT) to assess sites and the body surface area (BSA) of the lesions, dryness of the skin and varicose veins. The patients were asked about their age, sex, occupation and evaluated parameters, including the onset of disease, duration of current exacerbation, allergic history of both patients and their family, contact dermatitis history, current infection, systemic disease, history of malignancy, exacerbation due to summer or winter weather, frequent bathing, long periods of standing or walking, emotional stress, alcoholic drinking, drug use, duration of treatment, medication used and the lesion-free period. We assessed the relationship between stress and disease exacerbation by estimating the perceived stress scale and major life events that occurred over the previous 6 months.¹⁸⁻²⁰ The severity of itching was graded from 0 to 10 with the maximum score of 10 and the minimum score of 0.

The patients were also asked to complete the DLQI questionnaires, which consist of 10 questions, each referring to previous 7 days by themselves. The questions examined whether the disease had an impact on work, leisure, daily activities, personal relationship and treatment. Each question contained 5 possible answers: not relevant (not applicable), not at all, a little, a lot and very much, with the corresponding scores of 0, 0, 1, 2, and 3, respectively. The DLQI total score is calculated by adding the scores of 10 questions, with the maximum score of 30 and the minimum score of 0; the higher score, the greater the quality of life.

Statistical analyses

Statistical analyses were performed using a statistical software package (SPSS 16.0, SPSS Inc.; Chicago, Ill.). The general data, history and clinical characteristics were calculated to descriptive statistics. Comparisons of patients who had lesion-free periods and the possible aggravating factors and associated findings were performed using cross



tabulation for two-way table data and *t*-tests for continuous data. The DLQI were also assessed to be low and high score at the cut point at 7 (median) by descriptive analysis for distinct values and *t*-tests for continuous data. Associations between categorical variables were analysed by Pearson chi-squared test. Bi-variable and multivariable models were tested for significance of interaction among variables. Probabilities less than 0.05 were considered to be significant.

Results

One hundred patients with nummular eczema were enrolled into the study. Demographic data are shown in Table 1. Mean (SD) age was 42.1 (18.4) years (range 18-84 years) and two-thirds were women. About half of the patients were office workers and one quarter were labourers. The clinical characteristics of the patients are shown in Table 2. Forty-four patients reported a lesion-free period. Ninety-two patients had been treated before being enrolled in this study. The mean of the lesion-free period was 76.8 days (SD 195.6, range 0-1460, median 60 days). Forty-nine patients (53.3%) reported that the lesions had never cleared up, except when they used topical therapy. Most cases had pruritus. The mean score of the severity of pruritus was 5.8 (range 0-10, SD 2.8).

The locations of the lesions were as following: lower extremities (92%), upper extremities (61%), trunk (31%) and face and neck (15%). Mean(SD) total BSA was 3.2(3.8)% (range 0.2-31.1, median 2.0). Co-existing findings were dryness of the skin (67%), varicose vein (8%) and other skin diseases, such as chronic hand dermatitis (5%), prurigo nodularis (2%), cellulitis (2%), cutaneous fungal infection (2%) and miscellaneous (10%).

Table 1. Demographic data of patients with nummular eczema (n = 100)

Characteristics	Finding*
Age, years	
Mean (SD)	42.1 (18.4)
Range	18-84
Sex, No. (%)	
Male	33 (33%)
Female	67 (67%)
Occupation, No. (%)	
Office workers	47 (47%)
Labourers	24 (24%)
Traders	13 (13%)
Farmer	1 (1%)
None	15 (15%)

Table 2. Clinical characteristics of patients with nummular eczema (n = 100)

Characteristics	Finding*
Duration of the recent exacerbation, days	193.8 (579.3)
Mean (SD)	30
Median	2-4380
Range	
Duration from the beginning, days	1400.4 (1920.4)
Mean (SD)	730
Median	15-10950
Range	
Treated before, No. (%)	
Yes	92 (92%)
No	8 (8%)
Length of treatment, days	963.3 (1388.6)
Mean (SD)	365
Median	0-9125
Range	
Ever free of lesions, No. (%)	44 (44%)
Lesion-free period, days	76.8 (195.6)
Mean (SD)	60
Median	0-1460
Range	
Pruritus, No. (%)	97 (97%)
Severity of pruritus, days	5.8 (2.8)
Mean (SD)	0-10
Median	
Range	
Body surface area (BSA)	3.2 (3.8)
Mean (SD)	2.0
Median	
Range	
Dry skin	67 (67%)
Varicose vein	8 (8%)

The possible causes and associated findings in our patients with nummular eczema are shown in Table 3. Half of the patients had a personal history of atopy, mostly allergic rhinitis. Fourteen patients (14%) fulfilled Hanifin and Rajka's Criteria of atopic dermatitis.²¹ Thirty-eight patients (38%) had a family history of atopy, mostly allergic rhinitis. Although our data revealed co-existing infections, systemic disease and malignancy, there was no clinical relevance. The climate, i.e. winter and summer, exacerbated the lesions in some patients. The other findings were a history of contact dermatitis, frequent bathing, long periods of standing or walking, emotional stress, alcoholic drinking and some medication. Most of them were also not relevant to the disease except contact dermatitis, emotional stress and alcoholic drinking. Table 4 shows the factors related to the exacerbation of disease. Regarding a history of contact dermatitis, 49% reported a possible history of contact dermatitis. When we combined clinical

Table 3. The possible aggravating factors and associated findings in patients with nummular eczema (n = 100)

Findings	No of cases (%)*
Atopy	50 (50%)
Allergic rhinitis	32 (32%)
Allergic conjunctivitis	17 (17%)
Atopic dermatitis	14 (14%)
Asthma	12 (12%)
Family history of atopy	38 (38%)
Infection*	39 (39%)
Dental caries	26 (26%)
URI	16 (16%)
Cutaneous fungal infection	2 (2%)
Others	8 (8%)
Systemic disease**	43 (43%)
Dyspepsia	8 (8%)
Malignancy***	2 (2%)
Exacerbation during winter	36 (36%)
Exacerbation during summer	42 (42%)
Frequently bath	2 (2%)
Long standing/walking	18 (18%)
Medication****	38 (38%)

* Other infections; sinusitis, Hepatitis B, urinary tract infection, erythrasma, cellulites, infected wound

** Other systemic diseases; diabetes mellitus, hypertension, ischemic heart disease, vulvular heart disease, hyperthyroid, euthyroid, chronic renal failure, Sjogren's syndrome, scleroderma, rheumatoid arthritis, glaucoma, migraine, psychiatric disorder

*** Malignancy; lymphoma, prostate carcinoma

**** Fungal infection; Tinea cruris, Candida intertrigo

***** Medications; ASA, isosorbide dinitrate, HCTZ, furosemide, propranolol, atenolol, felodipine, enalapril, nifedipine, simvastatin, atorvastatin, gemfibrosil, glibenclamide, omeprazole, celecoxib, ferrous sulphate, folic acid, salbutamol, colchicines, plaquenil, haloperidol, lorazepam, benzhexol, bactrim, cephalixin, lamivudine

findings with patch test results, the most common allergen was nickel. No clinical relevance to gold, chrome or other allergens was found. Emotional stress and alcoholic drinking were also found to aggravate the disease.

Age, sex, occupation, duration of the recent exacerbation, history of atopy, history of contact dermatitis, infection, systemic diseases, malignancy, medications, winter, frequent bathing, long periods of standing or walking, emotional stress and alcoholic drinking, varicose vein and BSA had no statistically significant effect on the lesion-free period. By contrast, summer and the duration from the beginning of nummular eczema had a significant effect on the lesion-free period ($p = 0.04$ and $p = 0.04$, 95%CI 15.2–1527.1, respectively). The patients who had ever had lesion-free periods had longer onset by 771 days from the beginning than the patients who had never had that period. Dry skin

Table 4. Factors related to exacerbation of nummular eczema (n = 100)

Factors	Patients	Clinical
	No. (%) (N = 100)	relevant* No. (%)
History of contact dermatitis	49 (49%)	6 (12.2%)
Contact allergen		
Nickel	31 (63%)	4 (13%)
Rubber	7 (14%)	2 (29%)
Fragrance	7 (14%)	1 (14%)
Gold	6 (12%)	0 (0%)
Formaldehyde	3 (6%)	3 (100%)
Neomycin	2 (4%)	1 (50%)
Chrome	2 (4%)	0 (0%)
Others**	18 (36%)	N/A***
Emotional stress	31 (31%)	13 (42%)
Alcoholic drinking	15 (15%)	3 (20%)

* Clinical relevant means the exacerbation of disease associated with these factors.

** Other contact allergens; *Dermatophagoides*, wool, latex, chromium, cobalt, copper, thiuram, carba mix, TMTM, phenylene diamine, benzocaine, plastic, mint, tocopheral, cosmetic (unidentified)

*** N/A means not available.

had a borderline statistically significant ($p = 0.05$) effect on lesion-free period.

Ninety-two patients (92%) were treated before being enrolled in this study; all received topical steroids. Thirty-nine patients were treated with antihistamine (39%), 11 patients received systemic steroid (11%) and 3 patients received oral antibiotics (3%).

The average total DLQI score among our patients with nummular eczema was 9.2 (range 0-24, SD 6.8). The mean DLQI score of each question is demonstrated in Figure 1. Question No.1 (itchy) had the highest mean DLQI score (2.05) which represented the symptoms of the disease. Question No. 9 (sexual difficulties) had the lowest mean DLQI score (0.32); question No.7 (working) was the near-lowest mean DLQI score (0.34). When the patients were divided into two groups using the median DLQI score, 0-7 DLQI scores (n = 51) and 8-30 DLQI scores (n = 47). The younger age had higher DLQI scores than the older age ($p < 0.001$). The mean total DLQI score among males and females were not statistically significant between low and high DLQI score ($p = 0.88$). Most of the office workers had high DLQI scores, while most of the patients who had no occupation had a low DLQI score. The clinical findings of nummular eczema categorised by DLQI score are shown in Table 5. There were no statistically significant differences in the duration of the disease, the severity of pruritus,

Table 5. Demographic data and clinical characteristics by level of DLQI

Demographic data and characteristics	Low DLQI (0-7) n. 51	High DLQI (8-30) n. 47	P value
Age, years			< 0.001*
Mean (SD)	50.1(19)	33.4 (13)	
Sex, n (%)			0.88
Male	17 (53%)	15(47%)	
Female	34 (51%)	32(48%)	
Occupation, n (%)			0.002*
Office worker	17 (36%)	29 (63%)	
Labourer	10 (44%)	13 (57%)	0.35
Trader	9 (69%)	4 (31%)	0.18
None	14 (93%)	1 (7%)	< 0.001*
Duration, days			0.27
Mean (SD)	265.9 (815)	134.5 (208)	
Severity of pruritus			0.24
Mean (SD)	4.8 (2.8)	6.94 (2.3)	
Site of lesion, n (%)			0.31
Face and neck	6 (6%)	9 (9%)	
Trunk	10 (10%)	21 (21%)	0.008*
Upper extremities	27 (27%)	34 (34%)	0.053
Lower extremities	47 (47%)	45 (45%)	0.54
BSA			0.01*
Mean (SD)	2.1 (1.6)	4.4 (5.0)	

or the sites of lesions (except trunk) between the groups of patients with low and high DLQI scores. The patients who had more BSA involvement had higher DLQI scores.

Discussion

Nummular eczema was first described by Marie Guillaume Alphonse Devergie in the middle of the 19th century as a discoid lesion.²² Cowan and Hellgren reported that nummular eczema occurred in patients aged 20-60 years and 55-65 years, respectively.^{10, 23} In our study, the mean age of the patients was 42 years (range, 18-84 years). Because of our inclusion criteria, the minimal age of our patients was 18 years old; however, nummular eczema may actually occur in patients younger than those in this study. In most series there appears to be a male predominance (60-70%).^{10, 23} In contrast, our study showed that women predominated (67%). Most of our patients were office workers, which is in contrast to the previous study, where most patients were labourers and workmen.²³

Nummular eczema is most commonly seen on the lower extremities, followed by the upper extremities and the trunk.²³ Analysis of the anatomical distribution in our study showed a

similar pattern: 92% of patients had lesions located on the lower extremities, followed by upper extremities (61%), trunk (31%) and face and neck (15%). The dryness mostly on the lower extremities may explain the predilection of nummular eczema. Most patients experienced pruritus and rated their pruritus intensity variously. Pruritus did not seem to be associated with age or sex of the patients.

The pathogenesis of nummular eczema had not been fully elucidated.²³ This condition has a chronic and relapsing course.^{10, 23} Our study showed that the mean duration of the disease was 1400.4 days, 92% had ever been treated and 53.3% of the treated group had never had a lesion-free period, except when using topical treatment. The result seems to corroborate with the previous report (53%) that confirmed the chronic course of the disease.¹⁰ Many factors may play a role when the disease recurred or persisted, including internal factors such as atopic dermatitis, dry skin, stasis and emotional stress.^{1,3-5}

The proportions of atopy in different reviews were markedly variable. Weidman and Sawicky reported that the personal and family history of atopy in patients with nummular eczema were 11% and 15%, respectively.⁵ Hellgren reported 1.5% personal history of atopy and 2.5% family history of atopy.^{23,24} Kulthanan reported that nummular eczema was often found as an intrinsic factor in adult-onset atopic dermatitis.²⁵ Compared with previous reports, the present study showed a higher percentage of personal history of atopy (50%) and family history of atopy (38%). History of atopic dermatitis in our patients (14%) was higher than in the general Thai population (9.4%); however, allergic rhinitis and asthma were similar.²⁴

In contrast to the study of Bernard, who reported that 88% of their cases had varicose vein of the lower extremities, our study revealed only 8%.⁴ Stasis dermatitis, which is associated with varicose veins, may induce the auto-dermatitisation to present as nummular eczema.⁴ Emotional stress may also trigger the disease. There was a report of hypnosis-reduced pruritus and resolution of lesions.³ One third of our patients had emotional stress with a high percentage of clinical relevance.

External factors such as contact dermatitis, seasonal variation, infections, alcohol and drugs have been suggested to exacerbate the disease. Previous reports showed approximately 80% of nummular eczema had positive patch test and 17% to 33% had at least one clinically relevant positive patch test.⁶ Half of our cases had history and/or

positive patch tests of at least one agent; among these, 12% had clinical relevance. A previous report revealed that the most common positive patch test allergens were rubber, nickel, formaldehyde, neomycin and chrome, respectively.⁶ Our study showed that the most common allergen was nickel, followed by rubber, fragrance, gold, formaldehyde, neomycin and chrome, respectively. Nickel allergy in our study (63%) was higher than the previous study, which reported 18.6% nickel allergy in patients suspected of having allergic contact dermatitis in Thailand.²⁶ This implied that nickel plays an important role in nummular eczema. The limitation of our study was the small number of patch tests (16%), and the fact that twenty percent of them had no clinical relevance.

One report observed that heavy alcoholic drinking was associated with nummular eczema and most patients had abnormal liver function tests.¹¹ Fifteen percent of our patients drank alcohol regularly and only 20% addressed clinical relevance with disease exacerbation. There were reported clinical findings with nummular eczema such as infections,⁹ systemic diseases,²³ fungus,⁸ medication,¹² frequent bathing⁸ and long periods of standing.⁴ In our study, these factors had no association or did not cause exacerbation of the disease.

Dryness of the skin may play a role in the pathogenesis of this disease. Aoyama and colleagues demonstrated that elderly patients had a significant lower hydration state of the stratum corneum than the age-matched control.⁸ Our patients reported dryness of the skin (67%), although we did not use the evaporimeter or impedance meter to estimate trans-epidermal water loss and skin surface hydration. Patients who had dryness of the skin tended to have no lesion-free period (borderline statistical significance). Our results were similar to the previous reviews that stated that the disease deteriorated in the winter and summer.¹⁰

A comparison of clinical findings between groups of patients who had lesion-free periods and the patients who did not, summer exacerbation and the duration from the beginning of the disease showed a statistically significant difference. The patients who had exacerbation in the summer tend to have persisting disease. The patients who had lesion-free periods had longer duration from the beginning of the disease than the patients who had never been cured. This implied that nummular

eczema might take place for a long time before the patients would have a lesion-free period.

Concerning the quality of life of our patients with nummular eczema, itching caused the most significant impairment. However, the disease did not affect their working or studying much. Nummular eczema frequently located on the lower extremity, so the patients may not find it necessary to avoid public contact or cancel social engagements. The questions concerning sexual difficulties had the lowest DLQI score, which might be explained by Asian culture. Thailand is an Asian country where people seem to be embarrassed when they are asked about private matters. Another explanation was perhaps the BSA involvement, which may not have much of an effect on sexual behaviour. Age and occupations also influenced DLQI score. The younger had high DLQI category compared to the elderly. The office workers were in the highest DLQI category and the patients who did not have an occupation were in the low DLQI category. The patients with extensive lesions and lesions on the trunk also presented higher DLQI scores than others.

In summary, our study suggested that many clinical findings could be detected in nummular eczema. It is difficult to prove exactly what the aggravating factors are. However, the patients tended to have positive histories of atopic and contact dermatitis. Dryness of the skin might play a role in the exacerbation of this skin disease. Our results confirm that the disease usually persists and recurs several times. As demonstrated in DLQI score, nummular eczema affected the quality of life of our patients and itchiness caused the most significant impairment. The disease showed a high DLQI score among those who had younger age, were office workers or had extensive lesions.

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