

# Prednisone prescribing habits in the emergency room to treat rash

A retrospective medical chart review of skin rash cases presented to the ER suggests a need for further education on diagnosing and treating common dermatologic presentations and providing appropriate follow-up for acute skin disorders.

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## ABSTRACT

**Background:** A visiting dermatologist at a small community hospital in Northern BC observed an increase in the number of patients who were treated with prednisone for skin rash following an ER consult. In some cases, this was considered to be inappropriate and/or there was inadequate follow-up. The primary purpose of this study was to determine the prevalence with which prednisone was prescribed for nonspecific dermatology diagnoses in ER patients at the University Hospital of Northern BC (UHNBC), and the prevalence of follow-up referrals for those patients.

**Methods:** A retrospective medical chart review of patient visits to the UHNBC ER that presented with “rash and other nonspecific skin eruption” between 1 January 2016 and 31 December 2018 was conducted.

**Results:** Of those patients who were diagnosed with nonspecific rash in the ER (N = 463), 10.4% were prescribed prednisone. Most of those patients received nonspecific (45.8%) or uncertain (25.0%) diagnoses; 29.2% were given specific diagnoses. Most patients who were prescribed prednisone received a follow-up referral to a family physician (56.3%) or were referred to other health care providers (4.2%), a family physician who had an interest in dermatology (2.1%), or a dermatologist (2.1%). The rest did not receive a follow-up referral (35.4%).

**Conclusions:** We suspect that prednisone was used empirically to treat nonspecific or uncertain diagnoses of skin rashes in the UHNBC ER. This may have been related to a limited availability of dermatology services and support, and suggests a need for further education on using current guidelines for treating dermatological conditions and the importance of providing follow-up referrals for patients treated with prednisone.

## Background

Dermatology cases made up approximately 3.3% of all cases that presented to the emergency room (ER) in an Ontario study.<sup>1</sup> The most common skin presentations were skin infections, of which cellulitis was the most prevalent.<sup>1,2</sup> A US study found that 9.01% of adult dermatology cases that presented to the ER were diagnosed as “rash and other nonspecific eruption.”<sup>2</sup> Thus far, these types of statistics have not been reported for BC or Canada.

The term “rash” is commonly used to describe skin conditions, which according to the *Oxford Concise Medical Dictionary* are defined as “a temporary eruption on the skin, usually typified by discrete red spots or generalized reddening, that may be accompanied by itching,” as well as “a local skin reaction or the outward sign of a disorder affecting the body.”<sup>3</sup> Additionally, the *British Medical Journal* Best Practice Guidelines state that “The term ‘rash’ is also nonspecific and is sometimes incorrectly applied to any skin finding; ‘eruption’ may be preferred for a cutaneous reaction of acute onset.”<sup>4</sup> Alternatively, “maculopapular rash,” “exanthematous eruption” (exanthem), or “morbilliform eruption” are other nonspecific terms commonly used incorrectly to indicate any rash and can present as a “diagnostic challenge to the clinician.”<sup>4</sup>

Systemic corticosteroids are a mainstay of dermatologic therapy because of their potent immunosuppressive and anti-inflammatory properties, and are frequently used for severe dermatologic diseases. The most common indications for the use of systemic steroids to treat skin diseases are serious conditions such as blistering disease (e.g., pemphigous, bullous pemphigoid), connective tissues diseases (e.g., dermatomyositis, systemic lupus erythematosus), vasculitis, neutrophilic dermatoses, sarcoidosis, and urticaria/angioedema.<sup>5</sup> In addition, short courses of glucocorticoids may be used for a variety of forms of severe dermatitis, including contact dermatitis, atopic dermatitis, photodermatitis, exfoliative dermatitis, and erythrodermas.<sup>5</sup>

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Prednisone is an oral corticosteroid drug that can cause many serious side effects. Common adverse drug reactions ( $\geq 1\%$ ) when prednisone is used long term include hypertension, Cushing syndrome, impaired growth, hyperglycemia, adrenal suppression, gastrointestinal ulcer, osteoporosis, cataracts, glaucoma, and depression.<sup>6,7</sup> Oral corticosteroids are generally considered to be safe when used in short-term doses (less than 3 weeks duration), and are commonly used for acute presentations in the ER. Although rare, there are risks associated with short-term use, such as avascular necrosis, fatal varicella zoster in immunocompromised patients, severe mood changes, and psychotic reactions;<sup>8</sup> however, corticosteroid courses of less than 1 week duration that are prescribed in the absence of specific patient contraindications are unlikely to cause harm (except possibly for psychotic or prepsychotic episodes).<sup>8</sup> Because of these risks and the possibility that patients could experience additive effects from receiving multiple short-term corticosteroid courses over time, close monitoring of patients and tapering the schedule of treatment may be required, which can be done by a family physician or specialist. Inappropriate prescribing and lack of follow-up can lead to patient safety issues.

In a small community hospital in Northern BC, a visiting dermatologist observed an increase in the number of patient referrals for nondescriptive dermatology conditions such as “rash” over the course of a year, for which prednisone was prescribed following an ER consult. In some cases, this was considered to be inappropriate and/or there was inadequate follow-up.

There is a paucity of research in the current literature on prescribing prednisone to treat nondescriptive dermatology conditions. An investigation of diagnostic and prescribing practices for dermatology conditions in the ER might prove beneficial, because in Northern BC, many communities do not have a full-time dermatologist and instead rely extensively on ER physicians to treat dermatology patients. Enhancing this knowledge may also help guide future dermatology training initiatives for medical students, residents, and current ER physicians.

The primary purpose of this study was to determine the prevalence of nonspecific

dermatology diagnoses such as rash and maculopapular rash given to patients who presented to the ER at a small hospital in Northern BC and the prevalence with which prednisone was prescribed to treat those patients. We were also interested in determining how many of those patients were referred to a dermatology specialist or family physician to follow up on the diagnosis and/or treatment.

We hypothesize that ER physicians may give nondescriptive diagnoses such as rash and maculopapular rash to patients with dermatologic conditions rather than specific true diagnoses. We also hypothesize that a number of those patients who are not given a clear diagnosis are empirically treated with prednisone, which in some cases may not be appropriate. In addition, we suspect that many of those patients may not be referred to a specialist for follow-up.

## Methods

### Research design

A retrospective medical chart review was conducted to measure the prevalence of nonspecific dermatology diagnoses such as rash that were treated with prednisone, as reported in ER clinical encounter records from University Hospital of Northern British Columbia (UHNBC). The review focused on patients seen in the ER for dermatology conditions (ICD-10 Code R21: Rash and other nonspecific skin eruption) at UHNBC between 1 January 2016 and 31 December 2018. Information collected included patient age, gender, diagnosis, treatment, and referral.

### Data collection and analysis

The ER encounter medical charts were reviewed with assistance from Northern Health’s Health Information Management Services (HIMS) department, and the data were catalogued into an anonymized database. Excel software was used to analyze the data and perform descriptive statistics. Ethics approval was received from the University of British Columbia, the University of Northern British Columbia, and Northern Health H19-01950.

## Results

Between 1 January 2016 and 31 December 2018, 463 patients were seen in the ER for

rash and nonspecific skin eruption. Patient demographic information, certainty/specificity of diagnoses, and referral rates are provided in the **Table**. Approximately 66% of patients were given a nonspecific or uncertain diagnosis; about one-third received specific/certain diagnoses. Approximately half of the patients were referred to a family physician for follow-up; another 10% were referred to other health care providers, a dermatologist, or a family physician who had an interest in dermatology. Approximately 40% of the patients were not given a follow-up referral to a health care provider.

The most common treatments prescribed for rash or nonspecific skin eruption—sedating antihistamines, such as diphenhydramine (Benadryl) or hydralazine (Atarax), and supportive therapies [**Figure 1**—accounted for almost half of all treatments prescribed. Other prescribed treatments included topical treatments, followed by other therapies, oral antibiotic/antifungal/antiviral treatments, prednisone, nonsedating antihistamines, other systemic corticosteroids, further investigations with a biopsy, and IV antibiotics. In approximately 18% of cases, no therapy or further monitoring was prescribed.

Approximately 10% ( $n = 48$ ) of patients who were diagnosed with rash and nonspecific skin eruption were prescribed prednisone [**Table**]. Similar to all patients who were diagnosed with rash and nonspecific skin eruption, most patients (~71%) who were treated with prednisone were given a nonspecific or uncertain diagnosis; the rest received specific/certain diagnoses. Slightly more than half of patients who were treated with prednisone were referred to a general practitioner; another 8% were referred to other health care providers, a dermatologist, or a family physician with an interest in dermatology. Approximately one-third of patients who were treated with prednisone were not given a follow-up referral to a health care provider.

The percentage of rash cases in the ER that were treated with prednisone more than doubled from 2016 to 2017, then declined somewhat from 2017 to 2018 [**Figure 2**].

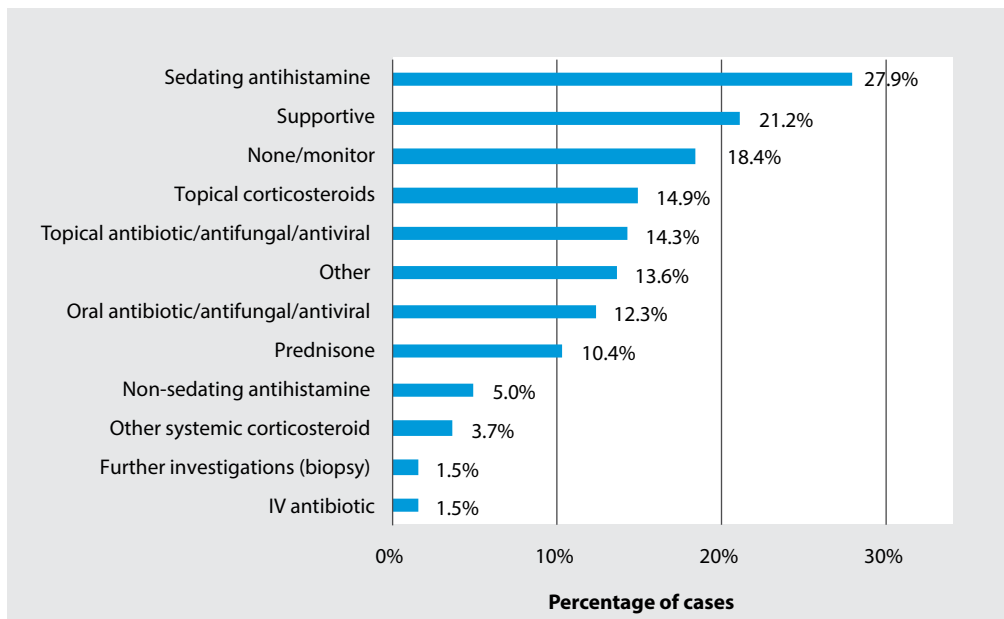
## Conclusions

Systemic corticosteroids were prescribed for 14.1% of patients who presented to the ER

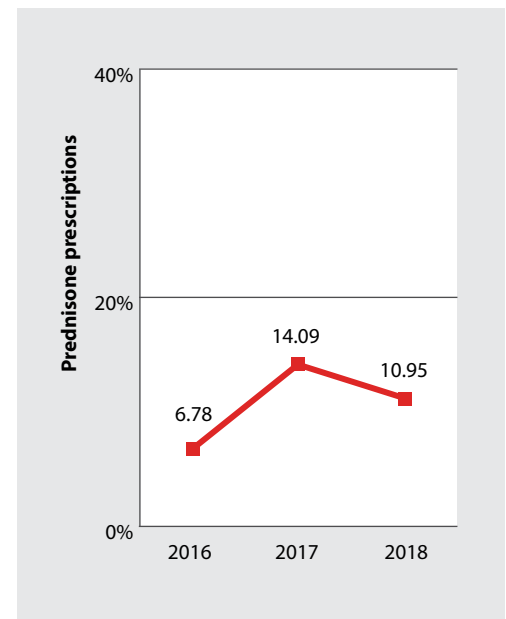
**TABLE.** Information for patients diagnosed with a rash at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 and those who were prescribed prednisone.

		All patients (N = 463) % (n)	Prednisone prescribed (N = 48) % (n)
<b>Sociodemographic characteristics</b>			
Age group	0–19	42.3 (196)	4.2 (2)
	20–39	21.6 (100)	22.9 (11)
	40–59	21.6 (100)	41.7 (20)
	60–79	11.9 (55)	22.9 (11)
	80–99	2.6 (12)	8.3 (4)
Gender	Male	47.1 (218)	43.8 (21)
	Female	52.9 (245)	56.3 (27)
<b>Rash cases</b>			
Certainty/specificity of diagnoses	Nonspecific	30.7 (142)	45.8 (22)
	Uncertain	35.0 (162)	25.0 (12)
	Specific	34.3 (159)	29.2 (14)
Referrals*	Family physician	51.6 (239)	56.3 (27)
	No referral	39.7 (184)	35.4 (17)
	Other	8.0 (37)	4.2 (2)
	Family physician dermatology	0.4 (2)	2.1 (1)
	Dermatology	1.7 (8)	2.1 (1)

\*In some cases, patients were referred to more than one provider type.



**FIGURE 1.** Treatments prescribed for rash diagnoses at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 (N = 463). Note: In some cases, more than one treatment was prescribed per patient.



**FIGURE 2.** Rates of prednisone prescribing for rash diagnoses at the University Hospital of Northern BC emergency room between 1 January 2016 and 31 December 2018 (N = 48).

with nonspecific rash, of which 10.4% were prescribed prednisone. Of those patients who were prescribed prednisone, approximately 71% received nonspecific and/or uncertain diagnoses for rash; therefore, we suspect that prednisone was being used empirically to treat such cases in the ER. This may be related to the lack of a full-time dermatologist in this Northern BC community and a perceived lack of support for physicians to make specific diagnoses. It is also possible that patients' conditions required further investigation or monitoring, which was not feasible in the ER setting. Few patients who were prescribed prednisone, however, were documented as waiting for further assessment.

Few patients who were treated with prednisone received a follow-up referral to a dermatologist, even though a visiting dermatologist regularly works in the hospital's outpatient clinic. It is possible that the ER physicians were not fully aware that this service was available, or access may have been limited due to lengthy wait times. To address the need for dermatology services, the community has a part-time family physician dermatology clinic, but it also appears to be underutilized. Although most patients were referred to their family physician, this may be a result of reflexive documentation, and it is unclear to what degree this was communicated to the patient or family physician. A large portion of patients (~35%) were not given a follow-up referral to a health care provider following their ER visit and prednisone therapy. Based on the lack of specific diagnoses for rash cases and the risks associated with inappropriate prednisone use, it was important for the patients to follow up with their primary caregiver or specialist for further investigation and monitoring and to ensure patient safety and continuity of care.

Additionally, it is worth noting the prevalence with which sedating first-generation antihistamines such as diphenhydramine were prescribed to patients in the ER who presented with nonspecific rash. It is possible that, like prednisone, sedating antihistamines were being prescribed empirically. Second-generation antihistamines are preferred for the treatment of dermatologic conditions such as urticaria because of their superior tolerability, safety, and efficacy, as well as nonsedating properties.<sup>9</sup> It

is possible that sedating antihistamines were prescribed out of habit due to their historical preference and to financial constraints of the hospital drug formulary and patient Pharma-Care drug coverage given that other treatments may be associated with higher drug costs.

The main limitation of this study is that the chart review was retrospective and relied on

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documentation of diagnostic codes and treatment. Coding is not mandatory, and only 51.5% of UHNBC ER cases had diagnostic codes recorded at discharge.<sup>10</sup> Additionally, coding takes time and may not be completed accurately by ER physicians. Prednisone was likely also prescribed for nonspecific rash cases that were listed under other diagnostic codes such as those for eczema, psoriasis, or urticaria. The certainty/specificity of diagnoses is a subjective classification. Because only 2% of patients who were treated with prednisone were referred to dermatology, it is challenging to assess the accuracy and validity of the prescribing that was provided.

This study suggests a need for further education in using current guidelines for treating dermatological conditions when considering the prescribing of prednisone. In addition, further education is needed on diagnosing common dermatologic presentations in the ER and on the importance of implementing follow-up for acute skin disorders after prednisone has been prescribed in the ER. Increased dermatology access and supports within underserved areas of BC is also needed for local patients. Further studies on dermatology cases that present in ERs in Canada and BC are also needed given

that the variable treatment of nonspecific rash is commonly recognized as a possible systemic issue. Also, prescribing trends identified in this study could be compared with those in other communities that have a dermatologist to determine if the prescribing of prednisone to treat nonspecific rash is related to a lack of dermatology services or is an ER-wide trend. Additionally, the ER physician rationale for using prednisone as an empiric treatment could be explored. ■

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#### Competing interests

None declared.

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