

# ENDGAMES

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## PICTURE QUIZ Erythroderma in the emergency department

A 29 year old man was referred to the dermatology department by the accident and emergency department because of a “maculopapular rash.” He had a four day history of an upper respiratory tract infection. Within half an hour of ingesting an over-the-counter flu remedy he developed redness and itching of his skin and a burning sensation in his groins and axillae. An hour later he felt systemically unwell with painful skin.

He had a history of infantile eczema, did not take regular medications or recreational drugs, and had no known drug allergies. He reported previous use of cold and flu remedies without ill effect, had no history of recent travel,

but admitted to a single episode of unprotected intercourse a month earlier with a female sex worker.

On examination, he was diaphoretic with cool peripheries, had a temperature of 38°C, his pulse rate was 120 beats/min, and his blood pressure was 110/56 mm Hg. Confluent erythema covered his entire body, with petechiae and oedema of his lower legs (figs 1 and 2). There were no palpable epidermal changes, there was no mucosal involvement, and Nikolsky’s sign was negative. He had cervical, axillary, and inguinal lymphadenopathy. Systemic examination was otherwise unremarkable. Bloods tests showed

leucocytosis with a neutrophilic shift, eosinophilia, and raised inflammatory markers (table).

- 1 What is the differential diagnosis of erythroderma in this patient?
- 2 How would you manage this patient initially?
- 3 What initial investigations are needed?
- 4 How might the causative agent of this eruption be identified?
- 5 How would you diagnose this condition?

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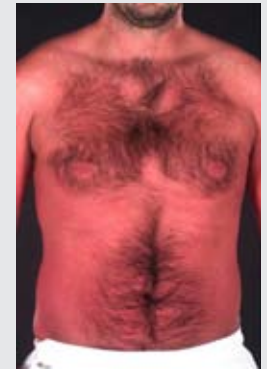


Fig 1

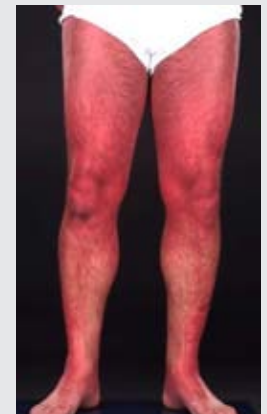


Fig 2

### Our patient’s sequential blood results

Parameter	Reference range	Day 1	Day 2	Day 4	Day 5	Day 21
White blood cell count (cells/L)	3.5-11×10 <sup>9</sup>	28.84	33.14	16.23	13.44	6.54
Neutrophil count (cells/L)	1.7-8.0×10 <sup>9</sup>	25.84	31.34	12.45	10.13	3.94
Lymphocyte count (cells/L)	1.0-4.0×10 <sup>9</sup>	1.38	0.76	2.34	2.35	1.89
Monocyte count (cells/L)	0.1-1.0×10 <sup>9</sup>	1.33	1.06	0.89	0.65	0.49
Eosinophil count (cells/L)	0.0-0.46×10 <sup>9</sup>	0.14	0.30	0.90	0.26	0.20
C reactive protein (mg/L)*	0-5	332	212	77	44	2
Alanine aminotransferase (U/L)	<37	45	31	NA	NA	39
Bilirubin (μmol/L)†	<17	26	8	NA	NA	11

## STATISTICAL QUESTION Meta-analyses: heterogeneity and subgroup analysis

Researchers undertook a meta-analysis to evaluate the effectiveness of comprehensive geriatric assessment in hospital for older adults admitted as an emergency. They included randomised controlled trials that compared comprehensive geriatric assessment with usual care. Comprehensive geriatric assessment is a multidimensional interdisciplinary diagnostic process used to determine the medical, psychological, and functional capabilities of a frail elderly person so as to develop a coordinated and integrated plan for treatment and long term follow-up. Usual care usually involved admission to a general medical ward setting under the care of a non-specialist. Twenty two trials were identified, evaluating 10 315 participants in six countries.

The primary outcome was “living at home” at the end of the scheduled follow-up period. This outcome was reported by 18 trials evaluating 7062 participants. The median follow-up was 12 months (range six weeks to 12 months). The test of heterogeneity for these trials gave  $\chi^2=28.49$ ,

$df=17$ ,  $P=0.04$ ,  $I^2=40\%$ . The total overall estimate indicated that the odds of a patient living at home at the end of scheduled follow-up were significantly higher in those patients who had undergone comprehensive geriatric assessment than in those who received usual care (odds ratio=1.16 (95% confidence interval 1.05 to 1.28;  $P=0.003$ )).

Subgroup analysis was undertaken, based on the type of model of comprehensive geriatric assessment performed. Two broad types of model were identified: assessment in designated wards by a coordinated specialist team; and assessment by mobile teams wherever the patient was admitted. The test of heterogeneity for “ward” gave  $\chi^2=17.66$ ,  $df=13$ ,  $P=0.17$ ,  $I^2=26\%$  while that for “team” gave  $\chi^2=1.86$ ,  $df=3$ ,  $P=0.60$ ,  $I^2=0\%$ .

The subtotal estimate for “ward” indicated that comprehensive geriatric assessment was significantly more likely to result in patients being in their own homes at the end of scheduled follow-up than was usual care (odds ratio 1.22 (1.1 to 1.35;  $P<0.001$ )). However, when comprehensive

geriatric assessment was undertaken by mobile teams its effects were inconclusive in comparison with usual care (odds ratio 0.75 (0.55 to 1.01;  $P=0.06$ )). The test for subgroup differences gave  $\chi^2=9.06$ ,  $df=1$ ,  $P=0.003$ ,  $I^2=89\%$ .

Which of the following statements, if any, are true?

- a) It can be inferred that homogeneity existed between the sample estimates across all trials.
- b) Homogeneity existed between the sample estimates in both subgroups of “ward” and “team.”
- c) It can be inferred that the effect of treatment on the primary outcome was different in the subgroups of wards and teams on the basis of the statistical significance in the subgroups
- d) A significant interaction existed between the subgroups of “ward” and “team” in the primary outcome.

Submitted by Philip Sedgwick

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