Be careful eating the local catch

An unusual case of mass scombroid poisoning in deployed forces in Indonesia

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INTRODUCTION

Our case begins in a setting far removed from a typical North American hospital. It begins in Sumatra, Indonesia during earthquake recovery efforts in November, 2009. An Australian Defence Force medical team was deployed to help with the recovery efforts. After a successful mission providing relief, the deployed forces started to pack up their supplies and prepared to leave in the next few days. Shortly after dinnertime, however, one of the staff members presented to the medical staff in the mobile centre with generalized urticaria.

INITIAL CONSIDERATIONS & RESPONSE

Acute urticaria, a red itchy rash often referred to as hives, can have multiple etiologies. The most common causes are related to allergic reactions to foods, medications, or insect bites. Although more common in pediatric patients, infections can also lead to acute urticaria in adults. Rarer causes for adult urticaria include vasculitis and systemic lupus erythematosus, but these usually present with other physical symptoms.

Due to the limited resources of the mobile centre and acute time frame of presentation, full testing could not be completed, so these rarer causes could not be completely ruled out. Based on the presentation of acute urticaria in isolation, a tentative diagnosis of an allergic reaction was given for the staff member and a search was done to elucidate the trigger for the reaction. Intramuscular adrenaline, oral promethazine, ranitidine, and intravenous steroids were administered. Before a trigger for the allergic reaction could be determined, however, another patient presented with a similar clinical picture.

ADDITIONAL CASES

A second staff member presented with truncal urticaria, oral angioedema, hoarseness, and dysphagia approximately 20 minutes after the first patient had sought assistance. The addition of a second case to this clinical picture so soon after the initial case, while not inconsistent with an allergic reaction, raised doubts about whether a hypersensitivity reaction was truly the underlying cause. This second staff member mentioned that some others were also feeling unwell and experiencing similar symptoms. Over another 20 minutes, 5 other staff members presented with varying degrees of urticaria, erythema, abdominal pain, and dysphagia. Given the setting—a mobile Australian Defence Force base in Indonesia—this massive influx of new patients had several important implications. Due to the small size of the mobile centre and because many of the supplies had been packed, the treatment capacity of the centre was quickly overwhelmed by this sudden influx of patients. The supply of adrenaline and steroids was quickly exhausted, and there were only two patient monitors available. To further compound this resource shortage, one of the senior nurses also began to show symptoms. Panic set in among the staff as they wondered about the identity of the trigger for these reactions. The search for a causative agent was intensified. The patients had some similar exposures that were investigated, such as a wet muddy field and a lightly damaged building they had visited previously; however, no causative agent could be found. Ingested toxins were also considered but none were identified at this point.

RESPONSE & RESOLUTION

As no causative agent could be found, evacuation of the patients to a nearby offshore ship, the HMAS (Her Majesty’s Australian Ship) Kanimbla, was requested. Medical staff on board the ship were informed of the situation and proceeded to conduct an internet search for possible causative agents. That search suggested the possibility of scombroid poisoning, a type of food poisoning associated with the consumption of fish. Further investigation revealed all affected patients had eaten 3 servings or more of a locally acquired white meat dish believed to contain fish. This dish was referred to as “ficken” by the Australian Defence Force medical team as a joke because of the inability to ascertain exactly what kind of meat it was made from. Upon questioning, other staff personnel who ingested smaller quantities of ficken reported some mild nausea and abdominal cramping. Based on these findings, a clinical diagnosis of scombroid toxicity was made and all patients were successfully treated with intramuscular adrenaline, ranitidine, intravenous steroids, and oral promethazine. Additional supplies and personnel were dispatched from the HMAS Kanimbla to assist with treatment.

SCOMBROID POISONING

Scombroid food poisoning generally occurs when histidine-rich fish are consumed after improper storage. Fish of the Scombroidi genus, such as tuna or mackerel, are the most common culprits, though other species fish have been implicated. The pathogenesis of scombroid poisoning is believed to be the conversion of histidine to histamine by bacteria, often gram-negative enteric bacilli such as Escherichia coli. The conversion process involves a decarboxylase enzyme, and occurs primarily when the fish is stored above 16°C. Other biogenic amines may play a role, though their effects have yet to be established. Nevertheless, the result is, in effect, poisoning by an overabundance of histamine. Symptoms vary, but are extremely similar to an immediate IgE-mediated hypersensitivity reaction and can include flushing, widespread urticaria, edema, nausea, and bronchospasm. Initial onset of symptoms often occurs within one hour of consumption of the affected food, and can persist for up to 36 hours.
hours.\(^4\) Scombroid food poisoning can be extremely difficult to di-
gnose, due to the similarity of its symptoms to those of an allergic re-
action and its atypical method of action. While scombroid poisoning
does involve bacterial spoiling of food, unlike more common forms
of food poisoning, killing the responsible bacteria does not eliminate
the toxin—high heat does not destroy histamine, so properly cooked
fish can still cause scombroid poisoning.\(^5\) Furthermore, there may
be no obvious signs of spoiling, as histamine does not change the odor
or appearance of the fish.\(^6\)

Diagnosis of scombroid poisoning can often be made clinically,
though additional testing may be used for confirmation.\(^5\),\(^6\),\(^7\) The
 timing of symptoms, with an initial presentation shortly after consump-
tion, is an important factor but may not help distinguish scombroid
from a standard allergic reaction.\(^5\) The keys to clinical diagnosis are
the absence of a history with allergies and the simultaneous onset
of symptoms with other patients.\(^5\),\(^6\),\(^7\) Blood histamine levels will
be highly elevated initially, with a significant reduction within 24
hours.\(^6\) Levels of histamine or histamine byproducts in the urine may
also be elevated.\(^6\) If a sample is available, direct testing of the ingest-
ed fish for histamine concentrations can also be diagnostic.\(^6\) In our
case, the situation precluded use of supplemental diagnostic tools,
and the diagnosis was made clinically.\(^1\)

Treatment for scombroid poisoning is supportive in nature.\(^1\),\(^7\)
Fast-acting antihistamines, fluids, and antipyretic agents should be
used to control symptoms as needed.\(^1\),\(^4\),\(^7\) Promethazine, the antihis-
tamine used in this case, is an older, first generation sedating anti-
histamine that is not frequently used in Canada; diphenhydramine is
traditionally the emergency antihistamine of choice. In extreme
cases, where closure of the airway becomes a concern, administra-
tion of adrenaline may be necessary.\(^1\),\(^7\) Use of corticosteroids has
been reported and was used in this case, although their value has
been questioned.\(^1\),\(^3\),\(^4\),\(^7\) Patients should recover within 36 hours as the
excess histamine is cleared from the body, though careful monitor-
ing is required to ensure symptoms are responding appropriately to
medication.\(^1\),\(^3\),\(^5\)

CONCLUSION

This case illustrates some of the challenges of practicing medi-
cine in a more remote area with limited supplies and resources, and
where backup cannot be accessed quickly. Treatment of patients
was initially hindered both because of a supply shortage and be-
cause health care providers who would normally provide treatment
were among the patients. Assistance eventually was provided by the
HMAS Kanimbla, but there was a 4-hour delay between the request
for assistance and help arriving. The lack of medical and human re-
sources made the search for the causative agent more difficult as well.
This is highlighted by the fact that foodborne illness was considered
but initially ruled out due to inadequate investigation. Moreover, ig-
norance about the regional cuisine—in this case, the mystery meat in
ficken—proved to be a barrier in establishing a diagnosis, as the com-
mon history of fish consumption was revealed only after scombroid
poisoning was proposed as a possibility, despite a concerted effort to
find a connection between patients. This highlights how practicing
medicine in unfamiliar locations or cultures can result in missing
knowledge, and therefore lead to an incomplete history.

However, this case also demonstrates the value of open lines of
communication. The ability to consult outside support and subse-
quently to call in additional resources was instrumental in achiev-
ing a successful response to this unique medical crisis.\(^1\) The insights
gained from this case are relevant to medicine practiced in situations
with limited resources and in situations where information is limit-
ed due to a culture gap. These lessons are increasingly important as
medicine continues to be practiced from a more global perspective.

REFERENCES

1. Ward DI. ‘Mass allergy’: acute scombroid poisoning in a deployed
2. Peroni A, Colato C, Schena D, Girolomoni G. Urticarial lesions: if not
urticaria, what else? The differential diagnosis of urticaria: part I. Cuta-
scombroid fish poisoning: an underrecognized dermatologic emergency
4. Stratta P, Badino G. Five things to know about scombroid poisoning. Can
5. Hungerford JM. Scombroid poisoning: a review. Toxicicon. 2010
Feb;56:231-43.
6. Bédry R, Gabinski C, Paty M. Diagnosis of scombroid poisoning by
342(7):520-1.