Occupational Dermatitis in New Zealand

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They found 8 publications related to occupational skin conditions, only 4 of which were about contact dermatitis (the other 4 were about warts (2), chilblains, and blister beetle dermatosis)

I found one more paper.
Of these 5 papers on occupational dermatitis, 2 were questionnaire studies which identified the prevalence of self reported dermatitis:

- one in boat builders,
- another in dentists
Another looked at 16 males with occupational dermatitis due to epoxy resins.

Another looked at 46 farmers investigated for contact dermatitis.

Another looked at occupational skin conditions (including dermatitis) presenting to a private dermatology practice over a 6 year period: (1987-1993)
The NOHSAC paper tells us that in 6 years (1992-1998) there were 311 notifications for occupational skin disease (including burns) to NODS.

In a 9 year period (1994-2003) there were about 560 paid ACC claims for occupational dermatitis.
…..so in a 5 yr period, that’s:

- 260 NODs (incl burns)
- 310 ACC claims
…and from all of this we’ve learned that:

- Occupational irritant contact dermatitis is more common than allergic contact dermatitis

- Hairdressers, food handlers, and health care workers account for the majority

- And we’ve learned a bit about dermatitis in farmers and boat builders
My data for the 5 years: (2003-2008)

105 cases
My data for the 5 years: (2003-2008)
Contact allergic dermatitis – my data

- Cement workers
- Health workers
- Food handlers
- Boat builders
- Builders & woodworkers
- Hairdresser & Beautician
My data for the 5 years: (2003-2008)
....some wild speculation

If other dermatologists see even 10% of the occupational cases that I do.
Mr C makes animal feed.
He usually works as an “intake operator” but he covers for workers in the “pre mix room” when they are on holiday (this amounts to about a week every 2 months).
He says he ONLY has a rash when he works in the pre mix room.
The pre mixes are amino acids, minerals, flavourings, grains, pharmaceuticals, and vitamins—they vary from batch to batch. He scoops them into a bucket which he tips into the machine, and then he goes into another room and does computery things.
Mr C has long sleeved overalls, but its very dusty in the pre mix room and the stuff gets down his sleeves.

He has a problem with generalised hyperhidrosis (ie he is very sweaty), and for this reason he is always wiping his face.
The rash usually starts on the flexor aspect of the forearm, and then affects the anterior neck, and then the eyelids swell up.

He says that it starts with welts and these turn into eczema.

He has no personal or family history of atopic conditions.
When first seen he had discoid eczema affecting the forearms, the anterior upper thighs, calves, and behind the knees.

Seemed an odd distribution for a contact allergy!

He said that this was the first time he had ever had rash on the lower limbs. It was usually forearms, neck, face.
Given the clear temporal association with the pre mix room his employer was advised that he could not work there.

……then his rash turned up again, despite not working in the pre mix room. So, we proceeded to investigate
He arrived with a VERY large box full of feed ingredients in resealable bags.

This was accompanied by a very slightly smaller box of material safety data sheets.

All substances were tested, unless they were deemed too irritating, and/or pointless (eg sodium chloride)
Patch test

- Routine screen
- Wheat flour
- Rye flour
- Barley flour
- Pea flour
- Rice flour
- Maize
- Avrax
- Lucerne
- Choline chloride
- Yeasacc
- Vitamin E
- Elancoban
- Rumensin
- Golden flake
- Tylan 250
- Soya
- Monteban
- Apralan
- Copra
Patch test

- Methionine
- Biolysine
- Threonine
- Biomass
- Broll
- Milk powder
- Mecadox

- Raspberry flavour
- Apple flavour
- Cattle flavour
- Calf flavour
Skin prick tests

- Carried out for all patch test allergens except the routine screen
- Plus positive and negative controls
Results

- Patch tests negative at 48 and 96 hrs
- Skin prick tests: positive control 6 mm, choline chloride 10 mm
Interpretation

- The one occasion Mr C had had a reaction when NOT working in the pre mix room, he had been packing bags of choline chloride.
- Rash affected forearms, neck and face; welts turned into eczema.
- Diagnosed contact urticaria to choline chloride.
- No previous reports of contact urticaria in literature; one report of positive patch test.
What is choline chloride anyway?

- (2-hydroxyethyl)trimethylammonium chloride
- ie a quaternary ammonium salt
- Sometimes called Vitamin B4
- Been used in humans for treatment of dementia and ataxia
- You can buy citrus flavoured choline chloride for human consumption off the internet.
- You can buy it for animal consumption from the Heng Feng Be-Long Choline Factory
- Minor irritant in animal and human studies.
In poultry choline is essential for yolk production and it prevents ‘perosis’ – slipping of the Achilles tendon.

In pigs one gets a better conception rate, and fewer piglets with leg disorders.

And in cows choline supplements result in better milk production.
Another chap…. 

- Mr C2 works at the same place; he is an engineer.
- One Saturday he stripped down a machine in the dog biscuit area, then finished the job on Monday, and on Tuesday he developed a rash on the flexor forearms, V of the neck, and the right upper and lower eyelids.
- The rash improved
- 3 weeks later he was again in the dog biscuit area (not working on the machine) and the rash flared up.
- The rash settled down again
Several weeks later he was back in the dog biscuit area – just talking for 10 minutes to the chap who was tipping stuff into the machine….and his rash flared up again ( V of neck and eyelids ).

No history of welts

Adult onset asthma; no prior history of rashes.
Patch test

- Routine screen
- Yellow oxide 420
- Yellow oxide 960/4
- Brown oxide
- Chrome green oxide
- Ponceau (red color)
- Vitamin E
- Wheat
- Ovine meal
- Pre mix vitamins
- Inulin
- Pea
- Poultry meal
- Meat meal
- Molasses
- Calf flavour
- Broll
- Premulac
- Golden flake
- Maize
- Feather meal
- Barley
- Montebran
- Soyameal
- Yeassac
- Elancoban
- Apple flavour
- Choline chloride
- Bovatec
- Aviax
Results

- Ponceau neg at 48 hours, + at 96 hr
- All others negative
- This confirmed the patient’s suspicions. He had checked with the worker in the dog biscuit room and found that *ponceau* had been added on each of his last 2 visits (and would have been present in the machine when he had stripped it down)
This red dye was an incredibly fine powder, like toner cartridge powder.

One could easily conceive of his face and V of neck being exposed, even though he was standing a couple of meters away from the fellow tipping the stuff into the machine.

I concluded that Mr C2 had a contact allergic dermatitis due to ponceau, despite the small patch test reaction.
Why am I telling you all this….?

- Occupational contact dermatitis cases can involve a lot of detective work

- Most dermatologists only patch test a routine screen; failing to test additional allergens will miss about 30% of relevant positive results.

- Some dermatologists don't patch test at all. Very few do skin prick tests.
Occupational dermatitis in NZ is under reported, under-recognised, and under-investigated

...and under-studied