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Severe anaphylactic reaction to latex rubber surgical gloves

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Immediate hypersensitivity to rubber is fairly common among people regularly exposed to rubber, although severe anaphylactic reactions are rare.^{1,2} We report a severe anaphylactic reaction in a woman who may have been sensitised to rubber during multiple operations and vaginal examinations.

Case report

A 31 year old woman became ill on her way home from a hospital consultation. Her face and eyelids swelled, her throat felt tight, and she became short of breath with wheezing. Her general practitioner arrived to find her moribund; diagnosed anaphylaxis; and injected adrenaline, chlorpheniramine, and hydrocortisone. She survived a respiratory arrest during transfer to hospital.

The woman's medical history included delayed hypersensitivity reactions to nickel and several operations (including appendicectomy, herniorrhaphy, right salpingo-oophorectomy, two laparoscopies, and four caesarean sections). During a consultation about an abscess at the site of a stitch the woman's gynaecologist had examined her vaginally while wearing a latex rubber glove; the anaphylactic reaction occurred about 10 minutes later. In retrospect, she recalled a less severe episode of facial swelling and wheezing after blowing up some balloons. Immediate hypersensitivity to latex rubber was thought to have caused her anaphylactic reaction.

The woman recovered fully within 24 hours and was discharged from hospital with syringes preloaded with adrenaline (0.5 ml 1/1000) for intramuscular injection and 240 mg of terfenadine to take orally at the onset of any attack. A blood sample taken 36 hours after the anaphylactic reaction showed normal C3 and C4 concentrations and a C1 esterase inhibitor concentration of 0.12 g/l (reference range 0.15-0.35 g/l), which excluded idiopathic angio-oedema.

The patient was subsequently noted to be dermatographic and had a positive hypersensitivity reaction 10 minutes after a prick test with a 1 cm square piece of a latex rubber glove but no reaction when a control polythene glove was used. Prick testing with natural rubber latex showed a 5 mm weal and 15 mm flare; no reactions were obtained in six control subjects. A resuscitation trolley, a syringe preloaded with adrenaline, and a plastic airway were close by during these tests. Patch tests with various rubber chemicals gave negative results, though those with nickel and cobalt gave positive results.

Four months later the woman developed wheezing and shortness of breath 30 minutes after her son directed the flow of air from a deflating rubber "whoopie" cushion (a joke cushion) at her face. She injected adrenaline, and the resulting reaction was less severe than the previous reaction, but admission to hospital was still required.

Comment

Immediate hypersensitivity is fairly common among people regularly exposed to rubber. Nine of 145 theatre staff in one Finnish hospital had local contact urticaria caused by wearing latex rubber surgical gloves, and similar allergic reactions occur in people who regularly use rubber cleaning gloves.¹

Many patients with contact urticaria caused by latex rubber gloves have similar reactions to products such as condoms and balloons. The allergen seems to be an unidentified protein eluted from natural latex rather than other chemicals in rubber or the powder inside gloves.² The prevalence of hypersensitivity to latex has increased since 1979, possibly because increased demand for condoms and other barrier devices has led to products that are poorly compounded and inadequately leached.²

Severe anaphylactic reactions to latex rubber are rare but are most commonly associated with medical procedures. Four patients developed systemic allergic reactions during childbirth when the obstetrician or midwife was wearing rubber gloves,³ and anaphylaxis during surgery was attributed to allergy to latex rubber in 12 patients.⁴ Fatal anaphylaxis occurred from the use of inflatable rubber cuffs in barium enema examinations.⁵ Many of the above patients had

previously been diagnosed as having contact urticaria caused by latex rubber and other atopic manifestations. Our patient had probably been sensitised by repeated contact with latex rubber surgical gloves during multiple operations and vaginal examinations.

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Recovery of bone density in women who stop using medroxyprogesterone acetate

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Depot medroxyprogesterone acetate works as a contraceptive by inhibiting the secretion of pituitary gonadotrophin and thus suppressing ovulation. Women who use it are partially oestrogen deficient, and we have previously shown that long term users have reduced bone density.¹ In this study we investigated whether such bone loss is reversible.

Patients, methods, and results

We recruited 54 women (50 of European origin, four of Maori origin. Group 1 comprised 14 women who had used depot medroxyprogesterone acetate for at least three years; they were studied while taking the drug and after having stopped it. Group 2 comprised 22 long term users of the drug, who were studied while they were taking it. The control group, group 3, comprised 18 women who had never used the drug. The age range in the groups was similar, but a higher proportion of women who had ever used the drug were cigarette smokers. While using the drug all the women had amenorrhoea. Of the women in group 1, 12

resumed menstruation within 2-24 (median 8) months, and two remained amenorrhoeic. Their plasma concentrations of gonadotrophins and oestradiol indicated that oestrogen production had been restored; thus all had become oestrogen sufficient.

Bone density in the second to fourth lumbar vertebrae and the femoral neck was measured twice in each woman, at an interval of 9-20 (median 12) months, by dual energy x ray absorptiometry; body weight was also measured. Sequential measurements within groups were compared with the paired *t* test and comparisons between groups with the unpaired *t* test.

When first measured bone density in the lumbar spine was on average 9.0% lower in groups 1 and 2 than the controls ($P < 0.02$) and bone density in the femoral neck was on average 5.7% lower (NS). At the second measurement, bone density in the lumbar spine had not changed in groups 2 and 3 but had significantly increased in group 1 ($P < 0.001$) (table); bone density in the femoral neck had not changed in any group. The mean increase in bone density in the lumbar spine in group 1 was 3.4% a year (95% confidence interval 1.6% to 5.2%); this occurred despite a significant fall in body weight (mean 2.2 kg, $P < 0.01$). Additional measurements of bone density in eight women from group 1 were made two years after they had stopped taking depot medroxyprogesterone acetate; bone density in the lumbar spine increased significantly between months 12 and 24 ($P < 0.002$), the mean increase overall being 3.0% (0.4% to 5.6%) at 12 months and 6.4% (3.4% to 9.4%) at 24 months.

Comment

Spinal bone density increased when long term users of depot medroxyprogesterone acetate became oestrogen sufficient, suggesting that bone loss related to use of the drug results from oestrogen deficiency. The increase occurred despite a fall in body weight (which usually favours bone loss) and a delay in the resumption of regular menstruation. In the women who were followed up for two years spinal bone density increased further in the second year. In our earlier study women using depot medroxyprogesterone acetate had an average 7.5% deficit in bone density in the lumbar spine.¹ The mean gain in bone density of 6.4% two years after the women in this study stopped taking depot medroxyprogesterone acetate suggests that the bone loss may be almost completely reversible even after long term use of the drug.

The changes in bone density in the femoral neck were less striking. Although we had previously found the deficit in bone density in the women using depot

Characteristics and bone density of women who had taken depot medroxyprogesterone acetate (DMPA) but had stopped (group 1), who were still taking DMPA (group 2), and who had never taken DMPA (group 3). Values are means (95% confidence intervals) unless stated otherwise

	Group 1 (n=14)	Group 2 (n=22)	Group 3 (n=18)
Ethnic origin (No of women):			
European	13	20	17
Maori	1	2	1
Median (range) age (years)	41 (25-49)	45 (26-51)	44 (26-51)
Median (range) duration of use of DMPA (years)	10 (3-17)	10 (5-20)	0
No (%) who smoked cigarettes	4 (22)	5 (23)	1 (6)
Body weight (kg):			
Initially	63.4 (60.2 to 66.6)	64.1 (58.8 to 69.5)	60.7 (56.7 to 64.7)
At follow up (kg)	61.2 (57.4 to 65.0)	65.9 (60.1 to 71.7)	60.1 (56.8 to 63.4)
Bone density (g/cm ²):			
Lumbar spine:			
Initially	1.095 (1.022 to 1.168)	1.114 (1.050 to 1.178)	1.235 (1.146 to 1.324)
At follow up	1.129 (1.058 to 1.200)	1.115 (1.054 to 1.176)	1.241 (1.156 to 1.326)
Rate of change (%/year)	3.4 (1.6 to 5.2)	-0.2 (-2.0 to 1.6)	0.3 (-2.2 to 2.8)
Femoral neck:			
Initially	0.932 (0.849 to 1.015)	0.896 (0.865 to 0.927)	0.965 (0.889 to 1.041)
At follow up	0.940 (0.861 to 1.019)	0.886 (0.858 to 0.914)	0.946 (0.869 to 1.023)
Rate of change (%/year)	0.8 (-1.8 to 3.4)	-1.1 (-2.6 to 0.4)	-1.5 (-3.2 to 0.2)