CONTACT HYPERSENSITIVITY TO LOCAL ANTIBACTERIAL AGENTS

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Summary

To find out the incidence of contact hypersensitivity due to various antibacterial agents, patch tests were performed with these medications in 101 patients suspected to have developed contact dermatitis due to some such agent. Positive patch tests were obtained with nitrofurazone (furacin) in 56 cases, neomycin in 28 cases, penicillin in 12 cases, tyrothricin (tyroderm), gentamicin (genticyn), framycetin (soframycin) and oxytetracycline (terramycin) in 13 cases each, triple sulfa and mercurochrome in 9 cases each and acriflavine in 4 cases. Two cases showed positive patch tests with brilliant green, but none with gentian violet. Twenty eight patients were negative with all the drugs tested. Many patients showed positive patch tests with more than one antibacterial agent. Neomycin 20% in petrolatum gave more frequent positive patch tests compared to the commercial 0.35% neomycin ointment or 20% aqueous neomycin, but there was no significant difference between the commercial 0.2% nitrofurazone ointment, 2% aqueous nitrofurazone, 0.2% aqueous nitrofurazone or 20% nitrofurazone in petrolatum. Of 22 controls, 6 patients showed positive patch tests with the commercial neomycin ointment as well as 20% neomycin in petrolatum, 1 patient with 0.2% nitrofurazone ointment and 5 patients with 20% nitrofurazone in petrolatum.

Neomycin is considered to be a common contact sensitizer all over the world[1-8], but in our previous analysis, contact hypersensitivity to nitrofurazone was found to be more frequent[9]. A study was, therefore, planned to find out the incidence of contact hypersensitivity due to some commonly used antibacterial agents among our patients.

Materials and Methods

All patients suspected to have contact dermatitis due to a local antibacterial agent were patch tested with the following commercially available medicines using standard techniques: furacin ointment (nitrofurazone 0.2% w/w in water soluble base), neomycin ointment (neomycin sulphate 3.5 mg/gm paraffin base), genticyn cream (gentamicin sulphate 0.1% w/w), terramycin ointment (oxytetracycline hydrochloride 30 mg/gm), soframycin cream (framycetin sulphate 1% in cream base), tyroderm cream (tyrothricin 0.05% in non-greasy base), penicillin ointment (penicillin G sodium, 5000 i.u./gm), triple sulfa cream (sulphathiazole 3.42%, sulphacetamide 2.86% and N-benzoylsulphanilamide 3.70% in a water dispersible cream), mercurochrome 2% aqueous, acriflavine 0.1% aqueous, gentian

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Received for publication on 15—2—1980

violet 1% aqueous and brilliant green 1% aqueous.

In 30 patients, patch tests were also done with 20% aqueous solution of neomycin sulphate and 20% neomycin sulphate in petrolatum in addition to the commercial 0.35% neomycin ointment.

A similar comparison was made in 41 patients between the commercial 0.2% nitrofurazone ointment and 2% aqueous solution of nitrofurazone. In 26 of these patients, 0.2% aqueous nitrofurazone and in the remaining 15 patients 20% nitrofurazone in petrolatum were used for an additional patch test.

In 22 control patients who had no clinical evidence of contact dermatitis due to the antibacterial agents, patch tests were done with the commercial 0.35% neomycin ointment, 20% neomycin in petrolatum, commercial 0.2% nitrofurazone ointment and 20% nitrofurazone in petrolatum.

Results

In all, 101 patients were studied, but all patients were not tested with all the drugs. Of these, 28 patients were negative with all the drugs tested. In the remaining 73 patients, the drugs giving positive patch tests are shown in table 1. The maximum number of positive patch tests were obtained with nitrofurazone while gentian violet did not produce a positive patch test in any case.

TABLE 1

Frequency of positive patch tests with various antibacterial agents

Drug	Number of patients		
	Tested	Positive	%
Furacin (Nitrofurazone)	73	56	77
Neomycin sulphate	70	28	40
Penicillin	46	12	26
Tyroderm (Tyrothricin)	65	13	20
Genticyn (Gentamicin)	66	13	19
Soframycin (Framycetin)	68	13	19
Terramycin (Oxytetracycline)	69	13	19
Triple sulfa	66	9	14
Mercurochrome	66	9	14
Acriflavine	68	4	6
Brilliant green	58	2	3
Gentian violet	58	0	0

Thirty two patients were allergic to only one drug, 16 patients were allergic to two drugs, 9 patients to three drugs, 7 patients to four drugs, 2 patients to five drugs, 5 patients to six drugs, while 2 patients were allergic to seven drugs.

With 20% neomycin in petrolatum, there were more frequent positive patch tests compared to the commercial 0.35% neomycin ointment or 20% aqueous solution of neomycin (Table 2). There was, however, no significant difference between the results of patch tests with various preparations of nitrofurazone (Table 3).

TABLE 2

Comparison of various preparations of neomycin for patch tests

Total number of patients tested	Number of patients showing positive patch tests with		
	Commercial neomycin (0.35%) ointment	20% neomycin aqueous solution	20% neomycin in petrolatum
30	10	2	15

TABLE 3

Comparison of various preparations of nitrofurazone for patch tests

Total number of patients tested	Number of patients showing positive patch tests with various preparations of nitrofurazone			
	Commercial 0.2% ointment	0.2% aqueous solution	2% aqueous solution	20% ointment in petrolatum
26	11	10	11	—
15	9	—	8	9

TABLE 4

Results of patch tests with preparations of neomycin and nitrofurazone in controls

Total number of patients tested	Number of controls showing positive patch tests with			
	Commercial neomycin (0.35%) ointment	20% neomycin in petrolatum	Commercial nitrofurazone (0.2%) ointment	20% nitrofurazone in petrolatum
22	6	6	1	5

Among the controls, 6 patients were positive with both the commercial neomycin ointment and 20% neomycin in petrolatum, 1 patient was positive with the commercial 0.2% nitrofurazone ointment and 5 patients with 20% nitrofurazone in petrolatum (Table 4).

Discussion

Contact hypersensitivity to local medications in our patients is quite frequent and often the patient is allergic to more than one drug. This is partly due to the fact that in our country medicines can be easily obtained without a proper prescription and self medication is very common.

The drugs causing contact dermatitis are likely to vary from time to time depending upon the antigenic potential of various drugs in use at different times. Some years ago, penicillin and sulphonamides were considered common contact sensitizers, but with the extensive use of neomycin, contact sensitivity to this agent became more frequent. Since the introduction of nitrofurazone in 1945[10], several cases of contact hypersensitivity are being reported[11-14] and in our study, it stands out as the most common contact sensitizer. Therefore, it seems necessary to assess from time to time the relative incidence of contact hypersensitivity to various agents in use.

Since all cases are not likely to be allergic to the most common sensitizer and a patient can be allergic to more than one drug, it seems preferable to test every such patient with as many drugs as possible, to find out the drugs which a patient can use and those which he must avoid. The need to use a proper concentration of the drug and an appropriate vehicle cannot be over-emphasized. This has been adequately highlighted in studies with neomycin[1-8], but should be assessed for other drugs as well. In the case of nitrofurazone, patch tests in all the previous studies[10-14] were done with 0.2% ointment and in our study, 0.2% ointment, 0.2% as well as 2% aqueous solutions of nitrofurazone and 20% nitrofurazone in petrolatum were almost equally efficient. There was only one case missed by 2% aqueous

nitrofurazone and another missed by 0.2% aqueous nitrofurazone. In the controls, however, 20% nitrofurazone in petrolatum produced more frequent positive patch tests indicating that these controls were in the process of developing contact hypersensitivity which was not very high at that time.

Brilliant green and gentian violet are known to be the safest antibacterial agents, but two of our patients showed positive patch tests with brilliant green. The reactions in both these patients were mild, but showed distinct papulo-vesicular lesions. In one patient, it was confirmed by repeated patch tests.

Acknowledgements

Patch tests in these cases were performed by V. K. Mehra and Rama Singhal.

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