MEDICAL ASPECTS OF GLOVE USE

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Medical gloves claim to act as a microbiological barrier between the hands of the health care workers and the things they touch in the course of their procedures. The domestic glove is that which protects the hands from general physical abuse and contact allergic dermatitis. However, there are inconsistencies on the type of hand protection recommended by different health authorities (CDC,1988). Recommendation on the appropriate use of these products may be better made by assessing the following aspects of glove use in Malta:

1 The appropriate use of gloves - which gloves to wear, when to wear them, when to change them and how many to wear at one time. Whether health care personnel are well informed about cross infection control.

2 Identification of problems associated with glove use such as glove perforation.

3 The role of the pharmacist as the supplier and health education on appropriate glove selection and in the identification and treatment of allergic contact dermatitis.

Study 1: 200 questionnaires were given to health personnel at our local hospitals and health centres. Various aspects of glove use such as type of glove, double gloving, glove re-use and problems such as contact-dermatitis were identified. Sheets of labelled glove samples were demonstrated.

Study 2: Used gloves were collected at the end of operations and tested for perforations, using the 300$\pm$25ml water night tests (ASTH standard, 1988).

The operation speciality, operation, duration, the status of the glove wearer and whether left or right handed, also the name and I.D. No. of the patient were recorded for each operation. 906 gloves were collected. The glove wearers and patients were followed up for any post operative infections. 2 controls were performed:

(i) Testing unused gloves for perforations
(ii) Surveying the storage areas of these gloves

Study 3: 154 questionnaires were sent to community pharmacists. Patch testing was performed on people suspected of suffering from allergic contact dermatitis.

Results:

Study 1

There was a 72% (n=144) response.
(A) aspects of glove use

Table 1: The types of gloves used for different procedures

	Incidence (%) of using the following gloves		
Glove Type	LSSG	VG/LEG	PE
Procedure Grading			
1. Sterile procedures	**60.61**	21.21	18.18
2. Unsterile procedures (protection necessary)	17.95	**48.72**	33.33
3. Low risk procedures (mild protection sufficient)	11.76	41.18	**47.06**

Abbreviations:

L.S.S.G. = Latex sterile surgical gloves
V.G. = Vinyl examination gloves
L.E.G. = Latex examination gloves
P.E. = Polythene examination gloves

Table 2: Glove material preferred according to procedure

Glove material	Latex (%)	Vinyl (%)	Polythene (%)
Procedure			
Surgical	**99.06**	0.944	-----
Examination	**65.05**	12.62	22.33
Dental Examination	**71.74**	13.04	15.22
Dental Surgery	**94.74**	------	5.26
Laboratory work	**60.78**	23.53	15.69

Table 3: Order of preference of gloves according to their properties

	Feel	Tear	Small	Size Range	Colour	Cost/pair
1	L.G.	L.G.	P.G.	L.S.S.G.	P.G.	P.E.G. (4c1)
2	P.G.	V.G.	L.G.	P.G.	L.G.	V.G. (11c6)
3	V.G.	P.G.	V.G.	V.G	V.G.	L.S.S.G. (18c2)

* L.G. = LEG or LSSG
P.G. = PEG or PSG (Polythene sterile gloves)

Health personnel mostly changed their gloves between different patients (37.95%) and between different procedures (32.76%) to prevent cross infection (56%) and for hygienic and sterility purposes (40%). 5.9% (n=15) said that they washed their gloves between patients and 2.10% (n=3) reused their gloves the following day. More than half the glove wearers (60.14%) have attempted double gloving and 3.5% said that they sometimes wore 3 gloves on each hand.

(B) Problems with glove use

Contact dermatitis is more common on ungloved hands (50.35%) compared to rubber allergic dermatitis (14.52%). Other problems have caused the glove wearers to remove their gloves.

Study 2

The rate of perforations in Malta was found to be 16.6% (n=150). This is approximately the average value of other similar studies performed abroad (Church et al, 1980; Matta et al, 1988; Brough et al, 1988; Dodds et al, 1988; Fell et al, 1989). Most of the gloves perforated were from obstetrics and gynaecology (29.16%) followed by orthopaedics (19.99%). These results are similar to UK (Fell et al 1989). Surgeons had most perforations (26.45%) followed by the theatre nurses (11.11%). A right handed glove wearer perforates his left hand glove more than his right and vice versa. There was a steady increase in the incidence of perforations with an increased operation duration (5 - 30 mins; 6.90% vs 185 - 210 mins; 50%). This also is similar to another study in England (M. Fell et al, 1988). Most of the pin-holes were found on the distal third of the thumb and index finger on the dorsal surface of the gloves and on the distal third of the palmer surface of the thumb and hand. Results are similar to the study performed by A. Cottone et al (1989). None of the glove wearers and patients suffered from any post-operative infection during and after completion of study. None of the unused gloves had any perforations. Adverse storage conditions were found for these gloves at Madliena, but a stock taking showed that the gloves used in the study had not been stored for a long time.

Study 3

Patch-testing is the method of choice for the identification of the cause of contact dermatitis. Only 16 out of 27 patients were found to be positive to the allergins used in the study. The ratio of patients when tested positive to disinfectants only, rubber only and to both, was 1:3:4. None of the patients gave a positive reaction or an irritant reaction to glove powder.

52 out of 154 (33.77%) questionnaires were received from pharmacists. The following table indicates the role of the pharmacist in glove use in the identification of contact dermatitis:

Table 4: Incidence of people coming in a pharmacy for advice on contact dermatitis on the hands

	Never	Rarely	Often	Very Often	Other
n	1	18	26	7	----
%	1.92	34.61	50.00	13.46	----

Table 5: Incidence of such people trusting the pharmacist and taking his/her advice

	Never	Rarely	Often	Very Often	Other
n	----	1	30	19	2 (did not know)
%	----	1.92	57.69	36.54	3.85

Table 6: Attitudes of pharmacists in treating rubber contact dermatitis

19.23% to stop wearing rubber gloves
37.18% to advice wearing cotton lined gloves
21.79% to advice wearing cotton gloves and rubber gloves on top
21.79% to send to do a patch test

Comparison of the pharmacists interested in setting up a patch testing service in their pharmacy to those who are not:

75% not interested
25% interested

Discussion

Health care personnel have a good knowledge of cross-infection control. They preferably use latex gloves for protection because of their high

tactile sense, tear resistance and size range. Polythene gloves are gloves of second choice because they are odourless, transparent and cheap.

Surgeons and operating staff should be aware of the possibility of developing perforation in their gloves so that precautions can be made to minimise the risk of cross infection.

People often come into a pharmacy for advice on contact dermatitis on the hands and often take the pharmacists' advice. Although 21.79% of the pharmacists said that they would send the patient to do a patch test only 25% were willing to set up a patch testing service in their pharmacy, the mean reason being that it was the doctor's role.

Conclusion

The pharmacist has an important role in advising glove wearers on the appropriate selection of glove types and use. Therefore the pharmacist should be the sole supplier of such products. With the setting up of a patch testing service in pharmacies, and further training the pharmacist is capable of identifying sources of contact dermatitis on the hands and giving appropriate treatment.

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