

Contact sensitization in patients with leg dermatitis

M. Nečas, E. Dastychová

I st dept. of dermatovenereology of the Masaryk's University and
St. Anna Faculty Hospital, Brno, Czech Republic



Leg (lower extremity) dermatitis

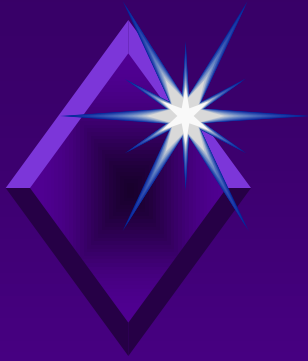
relatively common diagnosis

ddg :

- ◆ stasis dermatitis
- ◆ microbial eczema
- ◆ atopic dermatitis
- ◆ asteatotic dermatitis
- ◆ **allergic contact dermatitis**
- ◆ irritant contact dermatitis

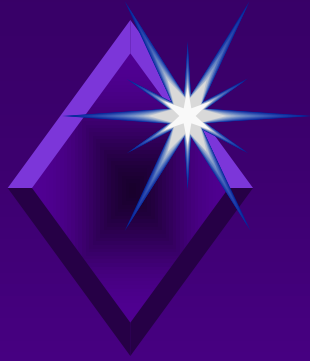
broader ddg:

- superfic. phlebitis
- vasculitis
- streptoderma
- lichen
- ACA
- pretibial myxoedema



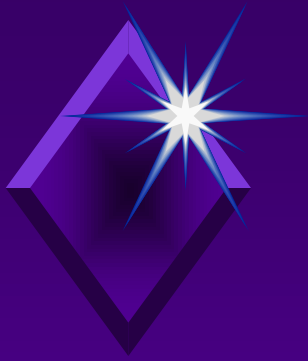
Microbial eczema





Asteatotic eczema





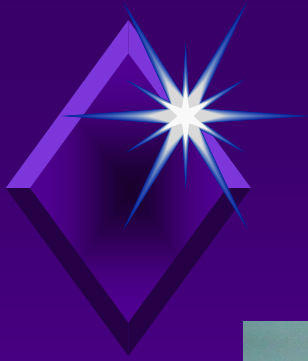
Atopic eczema





Differential diagnosis - feet

- ◆ Allergic contact dermatitis
- ◆ Dyshidrosis
- ◆ Tinea pedum – inflamed
- ◆ Tinea pedum with microbial eczema
- ◆ Plantar psoriasis
- ◆ Plantar keratoderma
- ◆ Others



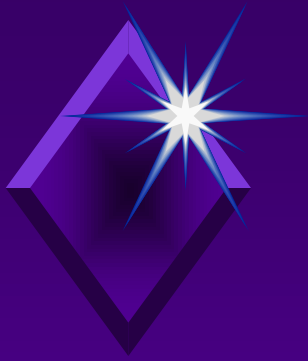
Inflamed tinea pedum





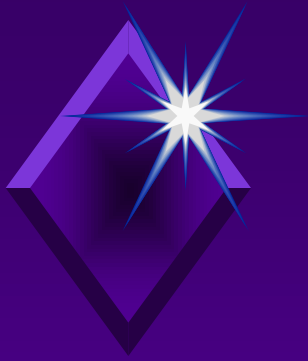
Tinea pedum with microbial eczema





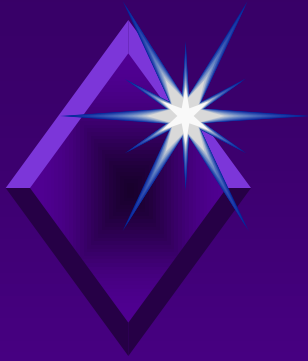
Plantar keratoderma





Plantar keratoderma





Leg contact dermatitis

- ◆ **Primary** allergic contact dermatitis
- relatively rare

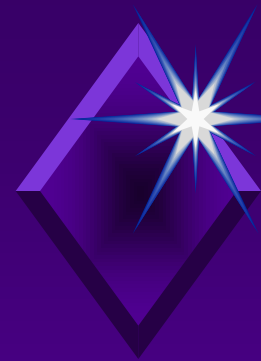
- ◆ **Secondary** ACD – common

in the terrain of stasis dermatitis, inflamed interdigital mycosis, around chronic leg ulcer or less often in any dermatosis treated with topical medical preparations (ATBs, corticosteroids etc.)



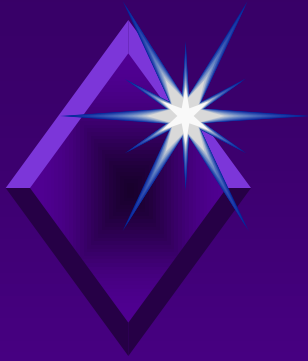
*Allergic contact dermatitis
caused by ketoprofene*





Allergic contact dermatitis





Leg contact dermatitis

promoting factors:

- ◆ chronicity of the disease
- ◆ prolonged application of topical medication
- ◆ disturbance of the skin surface
 - in leg ulcers or interdigital mycosis
- ◆ impaired skin barrier
 - in stasis dermatitis, asteatotic or atopic eczema



Source of potential allergens

◆ medical preparations:

- 1) active:
 - topical ATBs (neomycine, gentamycine, fusidic ac.)
 - disinfectants (PVP iodine)
 - natural substances (balsam of Peru,colophony
chamomile etc.)
 - topical corticosteroids
 - antifungal substances
 - antiinflammatory agents
(kebuzone, ketoprofene etc.)



Source of potential allergens

- 2) **adjuvants:** preservatives: formaldehyde
Quaternium 15
bronopol
kathon CG
chloracetamide
chlorhexidine
benzalkoniumchloride
thimerosal
paraben mix
- antioxidants: gallates
butylhydroxianisole, butylhydroxitoluene
sorbic acid
- emulsifiers: wool alcohols
triethanolamine
propylene glycol



Sources of potential allergens

- ◆ **cosmetic products** – mostly fragrances, natural substances and adjuvants
- ◆ **folk medicine** – mostly natural substances
propolis, tea tree oil,
asteraceae extracts
- ◆ **other sources** - chromium (chromic leather boots)
IPPD (black rubber boots)
rubber in elastic bandages
textile dyes in socks etc.



Contact sensitization in leg dermatitis

authors	I	II	III	IV	V	VI	VII
allergens	%	%	%	%	%	%	%
Balsam of Peru	29	21,3	30,0	15,6	20,0	38,0	22,8
Wool alcohols	30	8	9,0	?	?	30,0	17,2
Nickel sulphate	?	4	11,0	?	1,6	8,0	?
Fragrance mix	2,7	?	20,0	11,1	16	20,0	3,3
Colophony	?	13,3	NT	8,8	3,3	6,0	3,3
Neomycin sulphate	29	10,7	13,0	?	23,3	20,0	11,1
Fusidic acid	9	17,3	4,0	?	NT	NT	NT
Carba-mix	24	18,7	11,0	?	5	NT	NT
Paraben mix	?	12,0	?	?	18,3	20,0	13,9
PVP iodine	?	NT	NT	20	NT	NT	NT
Clioquinol	?	?	?	?	?	10,0	?
Budesonide	3	?	?	?	?	20,0	?

I – Tavadia et al.

II – Jankievič et al.

III – Saap et al.

IV – Freise et al.

V – Tomljanovič et al

VI – Zmudzinska et al.

VII – Ficova et al.

? - frequency not available

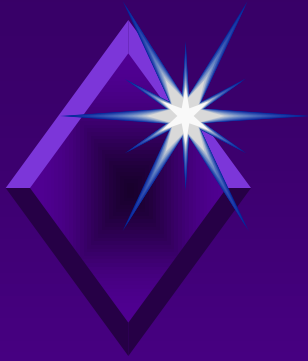
NT – not tested



Patients' demographic data

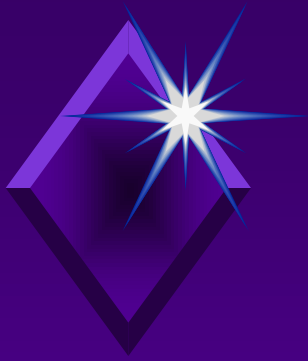
I st. dept of DV St. Anna Faculty Hosp., Brno, CZ (2001 - 2007)

	n	ϕ age	CVI without current leg ulcer		current leg ulcers	
			n	ϕ age	n	ϕ age
Total	462	49,1	148	59,2	73	63,5
Men	196	49,6	87	53,6	32	60,7
Women	266	48,7	61	63,0	41	64,3



Methods

- ◆ History
- ◆ Clinical investigation
- ◆ Patch tests
- ◆ Other: laboratory
 - bacteriology
 - mycology
 - biopsy

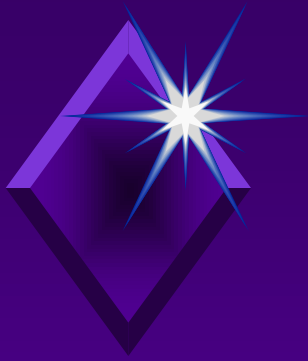


Methods

Patch tests: allergens of Chemotechnique diagnostic

- ◆ European standard series
- ◆ Special series: 19 constituents (adjuvants)
 - 5 natural substances
- ◆ Additional tests according to the anamnesis
(tested individually)

patch strips of Lohman & Rauscher company



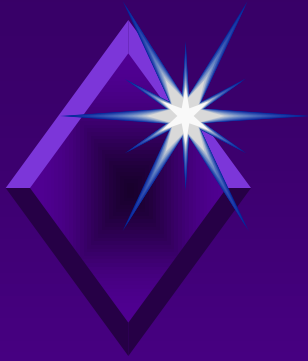
Methods

Application & readings according to ICDRG rules:

- ◆ upper back skin
- ◆ left for 48 hours
- ◆ evaluation at 48, 72, 96 hours, or 1 week (CS)

strength of reaction:

- negative
- ?+ doubtful reaction, only erythema
- + erythema with infiltration
- ++ papules, vesicles
- +++ coalescing papulovesicles



Patch tests results

	n	%		n	%
CS + *	218	47,2	> 1	110	23,8
			1	108	23,4
CS - **	244	52,8			

* CS+ contact sensitisation detected

** CS- contact sensitisation detected

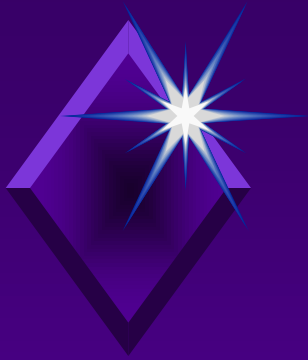
1999

FRAGRANCE

REIN BALSAM

PROFUMS

1999



Frequency of contact sensitization (ESS)

allergen		n	%
1.	Potassium dichromate 0,5 % pet.	15	3,2
2.	Neomycin sulphate 20 % pet.	17	3,5
3.	Thiuram mix 1% pet.	4	0,9
4.	Paraphenylenediamine 1% pet.	3	0,7
5.	Cobalt chloride 1% pet.	22	4,8
6.	Benzocaine 5% pet	2	0,4
7.	Formaldehyde 1% aq.	11	2,4
8.	Colophony 20% pet.	29	6,3
9.	Clioquinol 5% pet.	6	1,3
10.	Balsam of Peru 25 % pet.	44	9,5
11.	N-isopropyl-N-phenyl-4-phenylenediamine 0,1% pet.	13	2,8
12.	Wool alcohol 20% pet.	41	8,7
13.	Mercapto mix 2% pet.	4	0,9
14.	Epoxy resin 1% pet.	4	0,9

15.	Paraben mix 16% pet.	14	3,0
16.	4-t- butylphenol formaldehyd resin 1% pet.	8	1,7
17.	Fragrance mix 8% pet.	34	7,4
18.	Quaternium 15 1% pet.	3	0,6
19.	Nickel sulphate 5% pet.	39	14,9
20.	Kathon CG 0,01% aq.	4	0,9
21.	Mercaptobenzothiazole 2% pet.	3	0,7
22.	Sesquiterpenlactone mix 0,1% pet.	1	0,2
23.	Primin 0,01% pet.	0	0
24.	Tixocortol-21-pivalate 0,1% pet.	0	0
25.	Budesonide 0,01% pet.	4	0,9
26.	Methyldibromoglutaronitrile (1,2-dibromo-2,4-dicyanobutane) *		
27.	Fragrance II **		
28.	Lyrall**		

* included in ESS in 2005

** included in ESS in 2007



Frequency of contact sensitization (special tests)

	allergen	n	%
1.	Dodecyl Gallate (Lauryl Gallate) 0,3%	26	5,6
2.	Chloroacetamide 0,2%	20	4,3
3.	Dibromodicyanobutane/Phenoxyethanol (1:1) 1%	17	3,7
4.	Chlorhexidine Digluconate (In water) 0,5%	15	3,2
5.	Diazolidinyl Urea (GemallIII) 2%	14	3
6.	Benzalkonium Chloride 0,1%	11	2,3
7.	Trolamine (Triethanolamine)	9	1,9
8.	Triclosan 2%	8	1,7
9.	Imidazolodinyln Urea (Germall 115) 2%	6	1,3
10.	Glutar(di)aldehyde 0,3%	6	1,3
11.	Cocamidopropyl betaine 1%	6	1,3
12.	Butylhydroxyanisole 2,0%	5	1,1
13.	Propyl Gallate 0,5%	5	1,1
14.	DMDM Hydantoin (In water) 2%	4	0,9

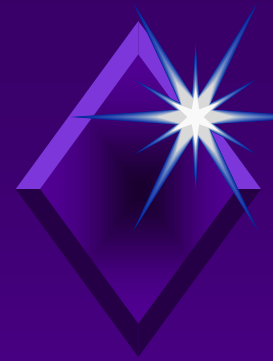
15.	Phenoxyethanol 1%	3	0,7
16.	Chloro cresol 1%	3	0,7
17.	Sorbic Acid 2%	3	0,7
18.	Propylene glycol 5%	2	0,4
19.	Butylhydroxytoluene 2%	2	0,4

1.	propolis 10%	35	7,6
2.	Chamomile extr. 0,5%	28	6,1
3.	Arnica extr. 0,5%	28	6,1
4.	Tea tree 10%	21	4,5
5.	Calendula extr- 2,5%	12	2,6



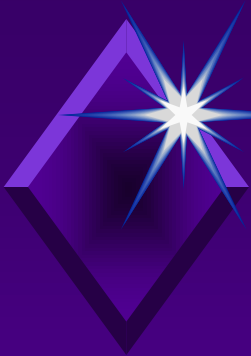
The most frequent allergens

	Allergen	n	%
1.	Balsam of Peru	44	9,5
2.	Wool alcohols	41	8,9
3.	Nickel sulphate	39	8,4
4.	Propolis	35	7,6
5.	Fragrance MIX	34	7,4
6.	Colophony	29	6,3
7.	Chamomile extr. Arnica extr.	28	6,1



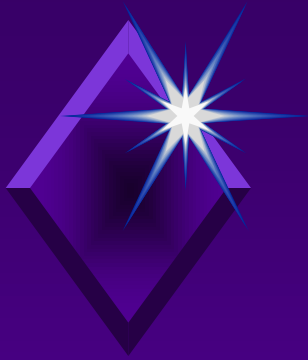
CS in leg ulcers: 65,4% *(n=73)*

	Allergen	n	%
1.	Balsam of Peru	21	26,9
2.	Wool alcohols	18	23,1
3.	Colophony Propolis Fragrance mix	8	10,3
4.	Neomycine sulphate Paraben mix Chamomile extr.	7	8,9



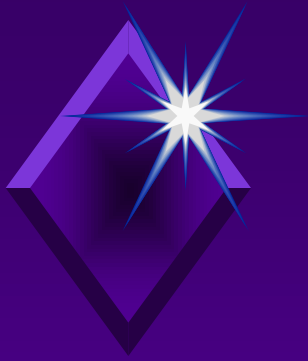
CS in tinea pedum: 52,4% *(n=21)*

	Allergen	n	%
1.	Tea tree	3	14,3
2.	Econazole Cyclopiroxolamine 2-aminotridekanadipate (Mykodecidin)	2	9,5
3.	Formaldehyde Colophony Wool alcohols Fragrance mix Nickelsulphate undecylenic acid (Mycoseptin) 2-chloro-4-nitrophenol (Nitrofungin)	1	4,8



Final diagnosis

Final diagnosis	n	%
Allergic contact dermatitis	138	29,9
primary	25	
secondary	113	
Microbial eczema/varicous dermatitis	112	24,2
Atopic dermatitis	108	23,4
Irritant contact dermatitis	39	8,4
Keratoderma/Hyperkeratotic eczema	23	5,0
Other: Tinea pedum	13	2,8
Palmoplantar pustulosis	12	2,6
Prurigo	5	1,1
Lichen ruber planus	3	0,7
Other	9	1,9



Conclusion

Spectrum of allergens unchanged:

top allergens: balsam of Peru

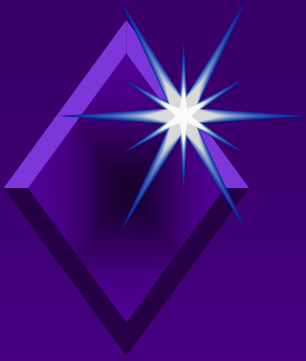
wool alcohols, parabens

colophony, fragrances

↓ neomycin sulphate

↑ corticosteroids

Frequency of contact sensitization still high



Conclusion

- ◆ **primary prevention:** reduction of the usage of potent contact allergens
(balsam of Peru, neomycine...)
- ◆ **secondary prevention:** suspicion of ACD
-> patch tests
- ◆ **tertiary prevention:** modification of topical treatment according to PT, labeled ingredients



Thanks for your attention

St. Peter's cathedral
Brno
Czech Republic

