

FIRST QATAR ALLERGY CONFERENCE

Adrenaline autoinjector is underprescribed in typical cold urticaria patients living in tropical climate countries

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ABSTRACT

Background: The diagnosis of typical cold urticaria (ColdU) relies on whealing in response to local cold stimulation testing (CST). It can also manifest with cold-induced anaphylaxis (ColdA). To date, it is largely unclear how often patients with ColdU receive adrenaline treatment and are provided with an adrenaline autoinjector (AAI).

Methods: An international, cross-sectional study, COLD-CE (i.e., comprehensive evaluation of ColdU and other cold-induced reactions), was carried out at 32 UCAREs. Detailed patient history was taken and CST with an ice cube and/or TempTest[®] performed. ColdA was defined as an acute cold-induced (ie, by cold water, air or surfaces) involvement of the skin and/or visible mucosal tissue and at least one of the following clinical signs/symptoms: cardiovascular manifestations, difficulty breathing, or gastrointestinal symptoms.

Results: Of the 551 ColdU patients, 75% ($n = 412$) had a positive CST. Of them, concomitant chronic spontaneous urticaria was diagnosed in 10%. Of 372 patients with stand-alone ColdU, 69% were women and 91% adults. Their median age was 36 (IQR 26 – 48) years. Patients were also categorized into residents of countries with a tropical ($n = 33$), temperate ($n = 264$), or cold ($n = 75$) climate (Table 1: R13C1, R17C1, R21C1). AAI was more often prescribed to residents of temperate than tropical countries (30% vs. 12%, $p = .038$; Table 1: R31C1), although the frequency of ColdA did not

significantly differ between these countries (44% vs. 42%, $p = 1.000$; R29C2). Residents of tropical countries had a higher frequency of ColdA induced by cold air than residents of temperate (36% vs. 12%, $p = .001$; R29C4) or cold (36% vs. 12%, $p = .007$; R25C4) countries. Cardiovascular manifestations induced by cold air were diagnosed in 33% ($n = 11$) of residents of tropical countries, but only 18% ($n = 2$) and 36% ($n = 4$) of them had received adrenaline and AAI, respectively (R13 – 15C7). Furthermore, hypotension and/or loss of consciousness induced by cold air occurred in 18% ($n = 6$) of patients, but only 17% ($n = 1$) received adrenaline (R13 – 14C10). ColdA was induced by complete cold water immersion in 9% ($n = 3$) of patients, and none of them received adrenaline treatment nor AAI (R13 – 15C3).

Conclusion: Our findings suggest that ColdA is undertreated and call for changes in ColdU management.

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Keywords: adrenaline autoinjector, cold urticaria, COLD-CE, cold-induced anaphylaxis

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Table 1. Previous adrenaline treatment, AAI prescription or both stratified by systemic reactions in typical ColdU patients.

	C1	C2		C3		C4		C5		C6		C7		C8		C9		C10	
		Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air	Any ^a	Air
ColdU		ColdA – broad definition		Cardiovascular manifestations		Hypotension and/or loss of consciousness													
	N = 372	145 (39%)	53 (14%)	107 (29%)	53 (14%)	116 (31%)	88 (24%)	31 (8%)	48 (13%)	41 (11%)	10 (3%)								
Mixed adult/ pediatric																			
R1	N = 372	145 (39%)	53 (14%)	107 (29%)	53 (14%)	116 (31%)	88 (24%)	31 (8%)	48 (13%)	41 (11%)	10 (3%)								
R2	12 (3%)	12 (8%)	4 (8%)	8 (8%)	4 (8%)	11 (10%)	7 (8%)	4 (13%)	8 (17%)	5 (12%)	3 (30%)								
R3	93 (25%)	54 (37%)	15 (28%)	44 (41%)	15 (28%)	49 (42%)	41 (47%)	9 (29%)	24 (50%)	21 (51%)	4 (40%)								
R4	8 (2%)	8 (6%)	3 (6%)	5 (5%)	3 (6%)	7 (6%)	4 (5%)	3 (10%)	5 (10%)	3 (7%)	2 (20%)								
R5	N = 338	135 (40%)	51 (15%)	98 (29%)	51 (15%)	106 (31%)	79 (23%)	29 (9%)	41 (12%)	35 (10%)	9 (3%)								
R6	10 (3%)	10 (7%)	3 (6%)	7 (7%)	3 (6%)	9 (9%)	6 (8%)	3 (10%)	6 (15%)	4 (11%)	2 (22%)								
R7	85 (25%)	51 (38%)	14 (28%)	42 (43%)	14 (28%)	46 (43%)	39 (49%)	8 (28%)	22 (54%)	20 (57%)	3 (33%)								
R8	7 (2%)	7 (5%)	2 (4%)	5 (5%)	2 (4%)	6 (6%)	4 (5%)	2 (7%)	4 (10%)	3 (9%)	1 (11%)								
R9	N = 34	10 (29%)	2 (6%)	9 (27%)	2 (6%)	10 (29%)	9 (27%)	2 (6%)	7 (21%)	6 (18%)	1 (3%)								
R10	2 (6%)	2 (20%)	1 (11%)	1 (11%)	1 (50%)	2 (20%)	1 (11%)	1 (50%)	2 (29%)	1 (17%)	1 (100%)								
R11	8 (24%)	3 (30%)	1 (50%)	2 (22%)	1 (50%)	3 (30%)	2 (22%)	1 (50%)	2 (29%)	1 (17%)	1 (100%)								
R12	1 (3%)	1 (10%)	1 (50%)	0	1 (50%)	1 (10%)	0	1 (50%)	1 (14%)	0	1 (100%)								
R13	N = 33	14 (42%)	12 (36%)	3 (9%)	12 (36%)	12 (36%)	1 (3%)	11 (33%)	7 (21%)	3 (9%)	6 (18%)								
R14	2 (6%)	2 (14%)	2 (17%)	0	2 (17%)	2 (17%)	0	2 (18%)	1 (14%)	0	1 (17%)								
R15	4 (12%)	4 (29%)	4 (33%)	0	4 (33%)	4 (33%)	0	4 (36%)	3 (43%)	1 (33%)	3 (50%)								
R16	2 (6%)	2 (14%)	2 (17%)	0	2 (17%)	2 (17%)	0	2 (18%)	1 (14%)	0	1 (17%)								
R17	N = 264	115 (44%)	32 (12%)	94 (36%)	32 (12%)	95 (36%)	80 (30%)	18 (7%)	38 (14%)	35 (13%)	3 (1%)								
R18	10 (4%)	10 (9%)	2 (6%)	8 (9%)	2 (6%)	9 (10%)	7 (9%)	2 (11%)	7 (18%)	5 (14%)	2 (67%)								
R19	78 (30%)	46 (40%)	10 (31%)	41 (44%)	10 (31%)	42 (44%)	38 (48%)	5 (28%)	20 (53%)	19 (54%)	1 (33%)								
R20	6 (2%)	6 (5%)	1 (3%)	5 (5%)	1 (3%)	5 (5%)	4 (5%)	1 (6%)	4 (11%)	3 (9%)	1 (33%)								
R21	N = 75	16 (21%)	10 (13%)	10 (13%)	9 (12%)	9 (12%)	7 (9%)	2 (3%)	3 (4%)	3 (4%)	1 (1%)								
R22	0	0	0	0	0	0	0	0	0	0	0								
R23	11 (15%)	4 (25%)	1 (11%)	3 (30%)	1 (11%)	3 (33%)	3 (43%)	0	1 (33%)	1 (33%)	0								
R24	0	0	0	0	0	0	0	0	0	0	0								

Table 1 – continued

R25	Tropical vs. cold (p-value)	.035	.750	.007	.007	.430	< .001	.009	.367	.003
R26	Adrenaline received ^b	.209	NA	.486	.486	NA	1.000	1.000	NA	1.000
R27	AAI prescribed ^b	1.000	.528	.338	1.000	1.000	1.000	1.000	1.000	1.000
R28	Both ^c	.091	NA	.486	.486	NA	1.000	1.000	NA	1.000
R29	Tropical vs. temperate (p-value)	1.000	.001	.001	1.000	< .001	< .001	.306	.781	< .001
R30	Adrenaline received ^b	.630	1.000	.297	.357	1.000	.622	1.000	1.000	.226
R31	AAI prescribed ^b	.038	.260	1.000	.549	1.000	.694	.699	.595	1.000
R32	Both ^c	.219	1.000	.176	.176	1.000	.539	1.000	1.000	1.000
R33	Temperate vs. cold (p-value)	< .001	< .001	1.000	< .001	< .001	.267	.015	.023	1.000
R34	Adrenaline received ^b	.125	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
R35	AAI prescribed ^b	.011	.512	.401	.729	1.000	1.000	.606	.595	1.000
R36	Both ^c	.345	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Note: Data are given as no. (%). Statistical significance of differences between patient groups was calculated using Fisher's exact test. Statistically significant p-values ($p < .05$) are in bold. **Abbreviations:** AAI, adrenaline autoinjector; C, column; ColdA, cold-induced anaphylaxis; CWI, complete cold water immersion; N, number of patients; NA, not applicable (ie, no statistics are computed because at least one of the variables is a constant); R, row.

^aAny cold trigger (i.e., complete cold water immersion, cold ambient air exposure, transition from cold outdoors to warm indoors, localized contact with cold liquids without immersion or ice, and contact with cold surfaces).

^bUnknown indication(s).

^cAdrenaline received & AAI prescribed.