

Comparison of VAS and verbal rating scale in Japanese patients using VAS with 10-point end of “worst imaginable itch”

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Background

- Pruritus is a subjective symptom with multiple factors that cannot be measured objectively to date.
- There have been no established methods to estimate the intensity of pruritus quantitatively.
- Common tools for self-report of pruritus intensity in adult patients:
 - Visual analogue scale (VAS)
 - Numerical rating scale (NRS)
 - Verbal rating scale (VRS)



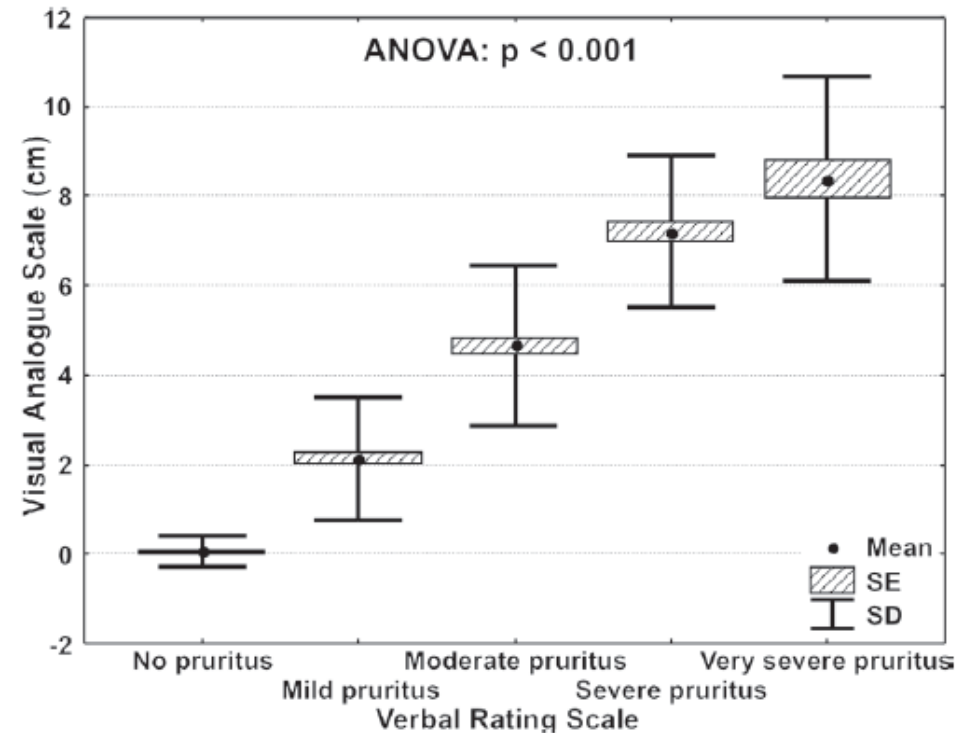
0: No pruritus	3: Severe pruritus
1: Mild pruritus	4: Very severe pruritus
2: Moderate pruritus	

CLINICAL REPORT

Visual Analogue Scale: Evaluation of ment of Pruritus

Adam REICH¹, Monika HEISIG¹, Ngoc Quan PHAN², Kenichi TANEDA⁴,
FURUE⁴, Christine BLOME⁵, Matthias AUGUSTIN⁵, Sonja STÄNDER²

- The patients (n=310) assessed pruritus
- VRS showed the highest correlation with VAS (R=0.75, $p < 0.0001$).
- Each category of VRS differs significantly from the others regarding VAS.
- They defined the bands of VAS based on detailed analysis: 0 = no pruritus, >0 - <4 points = mild pruritus, ≥4 - <7 points = moderate pruritus, ≥7 - <9 points = severe pruritus, and ≥9 points = very severe pruritus.
- They found some differences in VAS scoring between Caucasian and Japanese subjects.

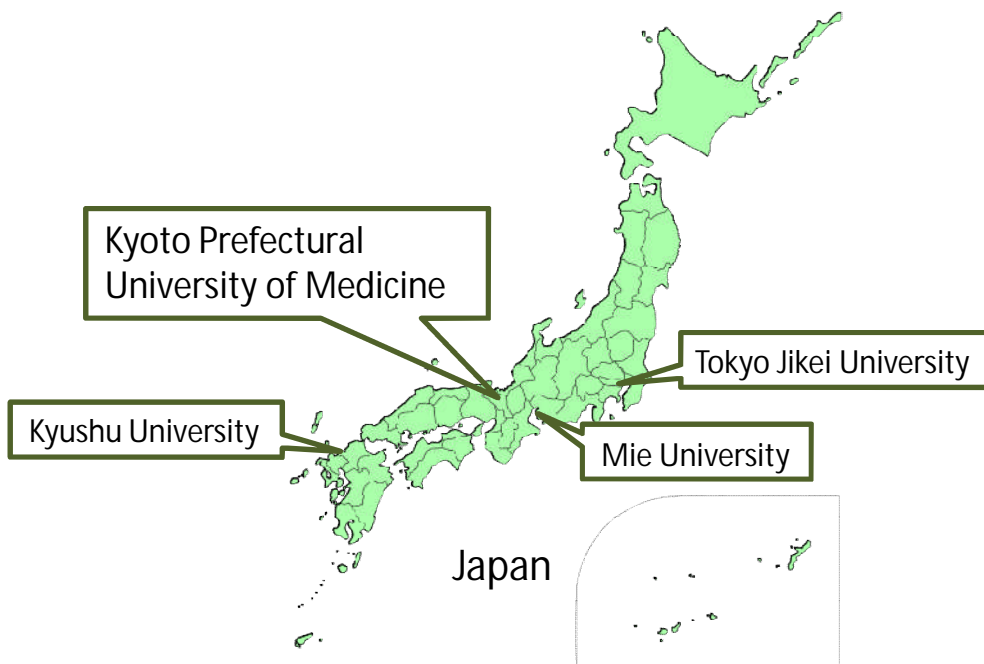


Aim of this study

- To assess the relationship between VAS and VRS in randomly selected Japanese patients with itchy skin diseases.
- To define the set of VAS bands referring to mild, moderate, severe, and very severe pruritus according to the report by Dr. Reich et al.
- To assess the reproducibility regarding ethnic differences in itch score.

Subjects and interview sheet

Subjects: Patients, aged over 10 years and visited the dermatological departments of 4 university hospitals between April 2012 and January 2013, were interviewed about their pruritus using VAS and VRS.



ID:
月日: **date/month**

医師記入欄: 最も関連する病名を一つ記載!!

疾患名: **disease**

かゆみは、皮膚病の重要な症状の一つです。
あなたのかゆみについて、教えてください。
患者さんご自身で、記入してください。

① 年齢:歳。
age

② 性別: []男(M) []女(F)
gender

③ かゆみがありますか? []はい(Y) []いいえ(N)
Are you feeling itch?

④ この24時間で感じた最も強いかゆみを、下線に / を入れることで表現してください。**Visual Analogue Scale (VAS)**

例 かゆみなし ————— / ————— 考えられる最も強いかゆみ
0 10
かゆみなし ————— 10 考えられる最も強いかゆみ

↑
この線の長さは必ず10cmにしてください。

⑤ この24時間で感じた最も強いかゆみを、言葉で表現すると以下のどれになりますか。**Verbal Rating Scale (VRS)**

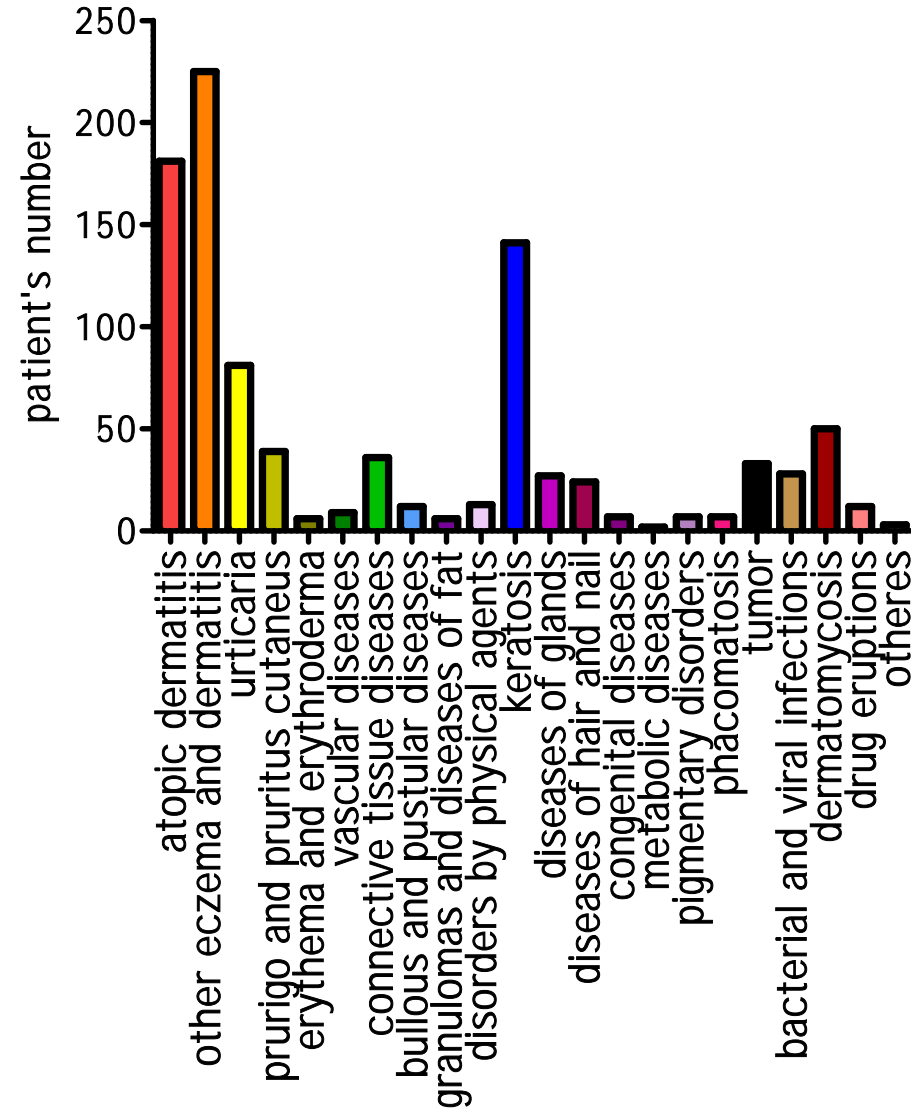
- [] かゆみなし(0) **0: No pruritus**
- [] 弱いかゆみ(1) **1: Mild pruritus**
- [] 中ぐらいかゆみ(2) **2: Moderate pruritus**
- [] 強いかゆみ(3) **3: Severe pruritus**
- [] とても強いかゆみ(4) **4: Very severe pruritus**

Patients

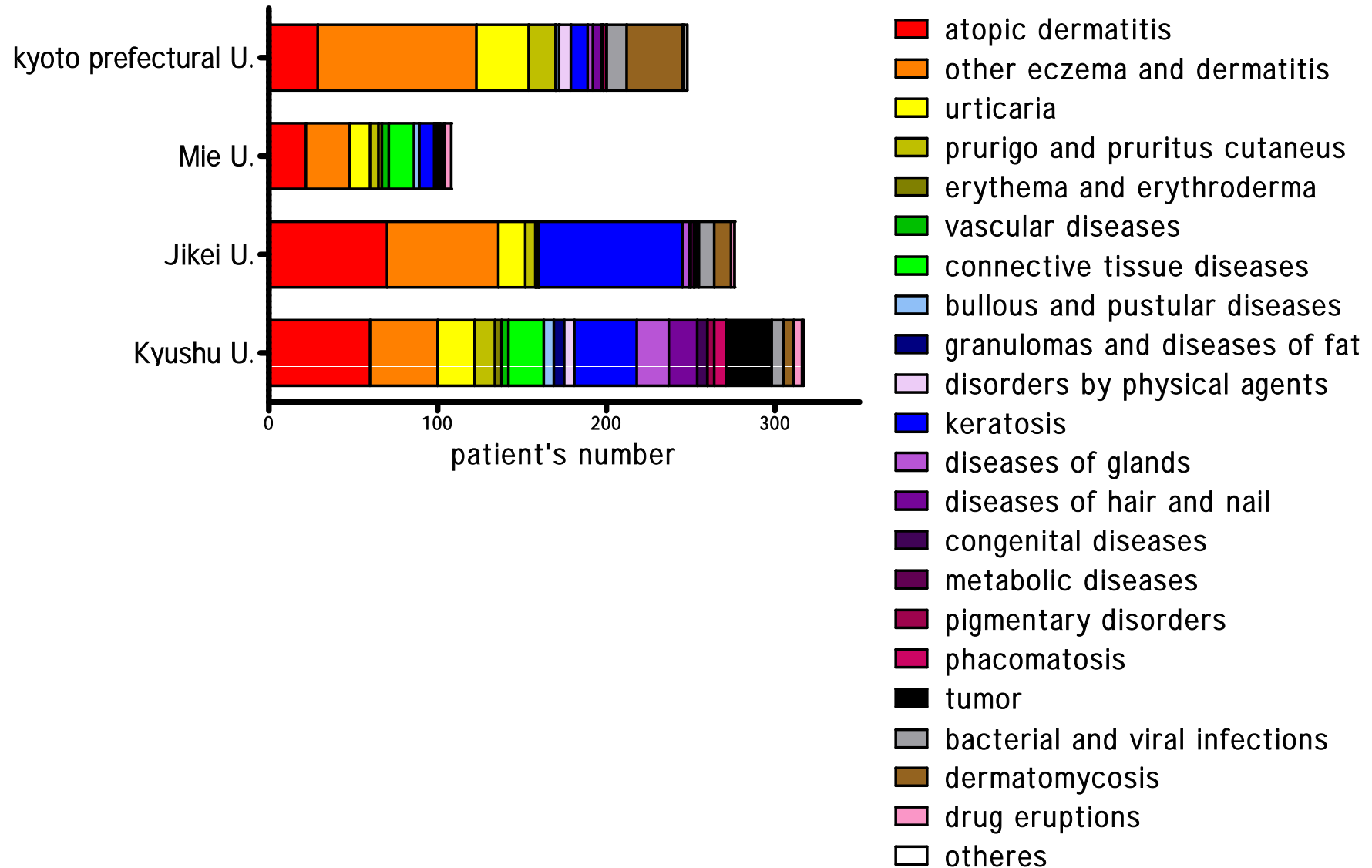
	total	KPUM	Mie U.	Jikei U.	Kyushu U.
Patient's number	949	238	108	277	316
male : female	446 : 503	119 : 129	54 : 54	145 : 132	128 : 188
age	52.6 ± 19.3	57.8 ± 22.2	57.9 ± 18.1	49.1 ± 16.8 ^{***}	49.8 ± 18.0 ^{***}

***: p<0.0001 vs. Kyoto prefectural U. or Mie U.

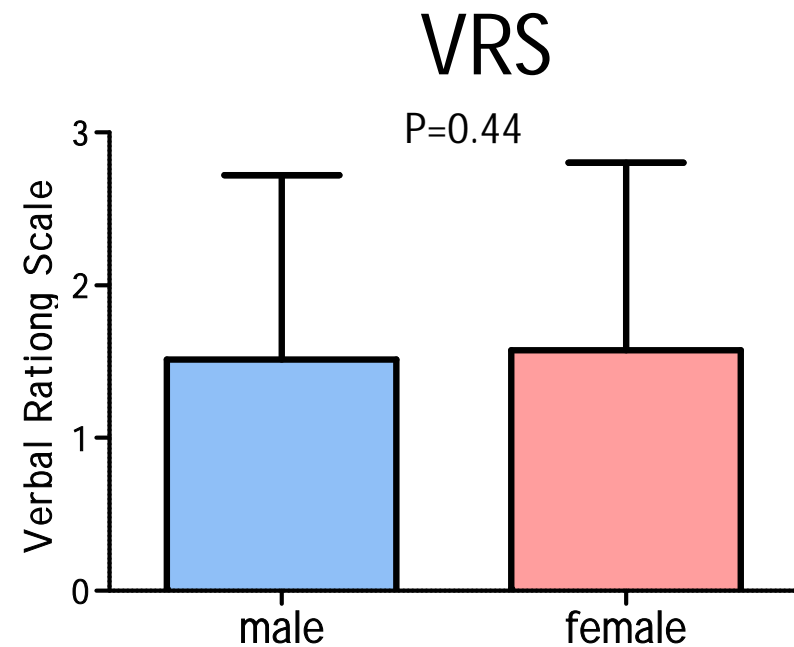
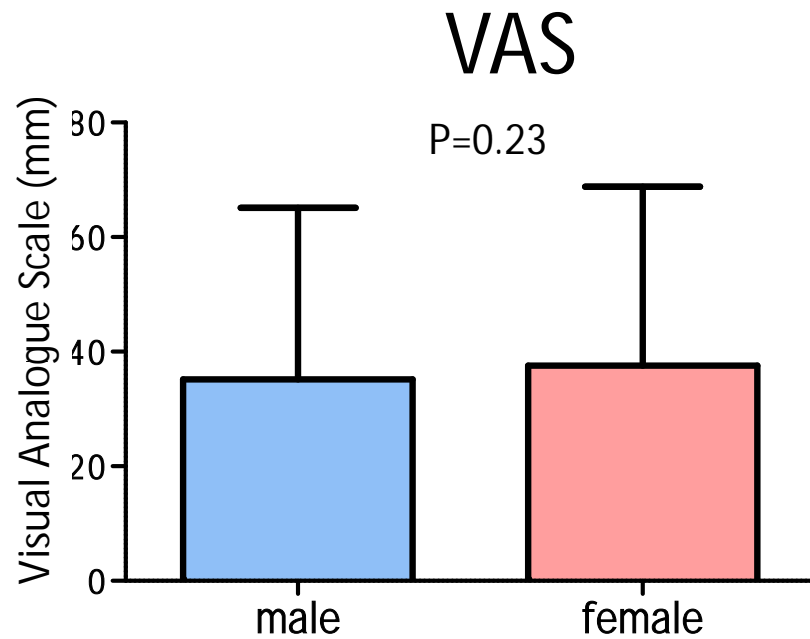
The diagnoses had a wide variety



Distribution of disease in each facility



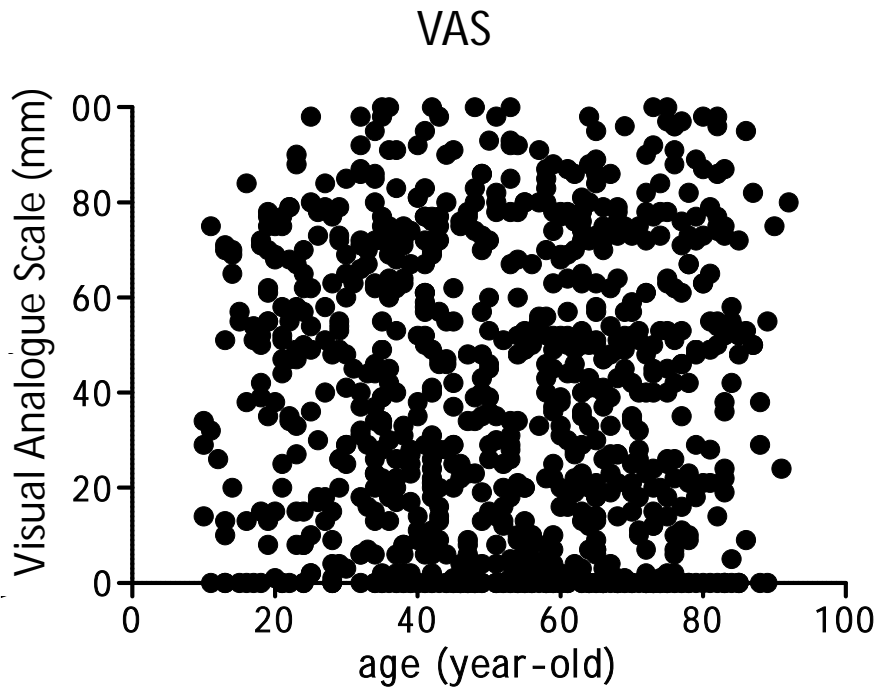
Gender of patients did not influence the pruritus intensity scoring assessed with VAS or VRS



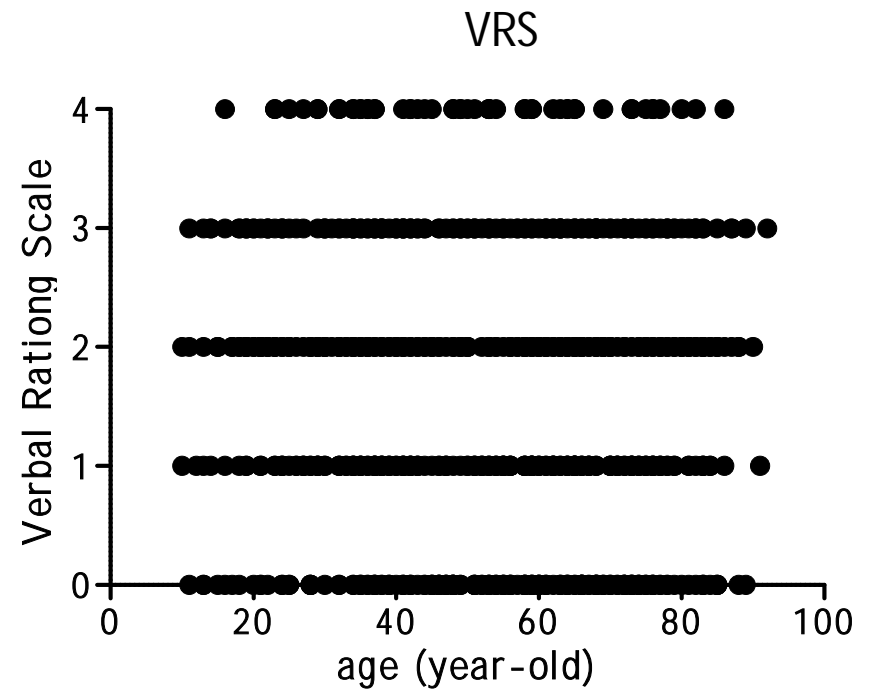
Verbal Rating Scale (VRS)

- 0: No pruritus
- 1: Mild pruritus
- 2: Moderate pruritus
- 3: Severe pruritus
- 4: Very severe pruritus

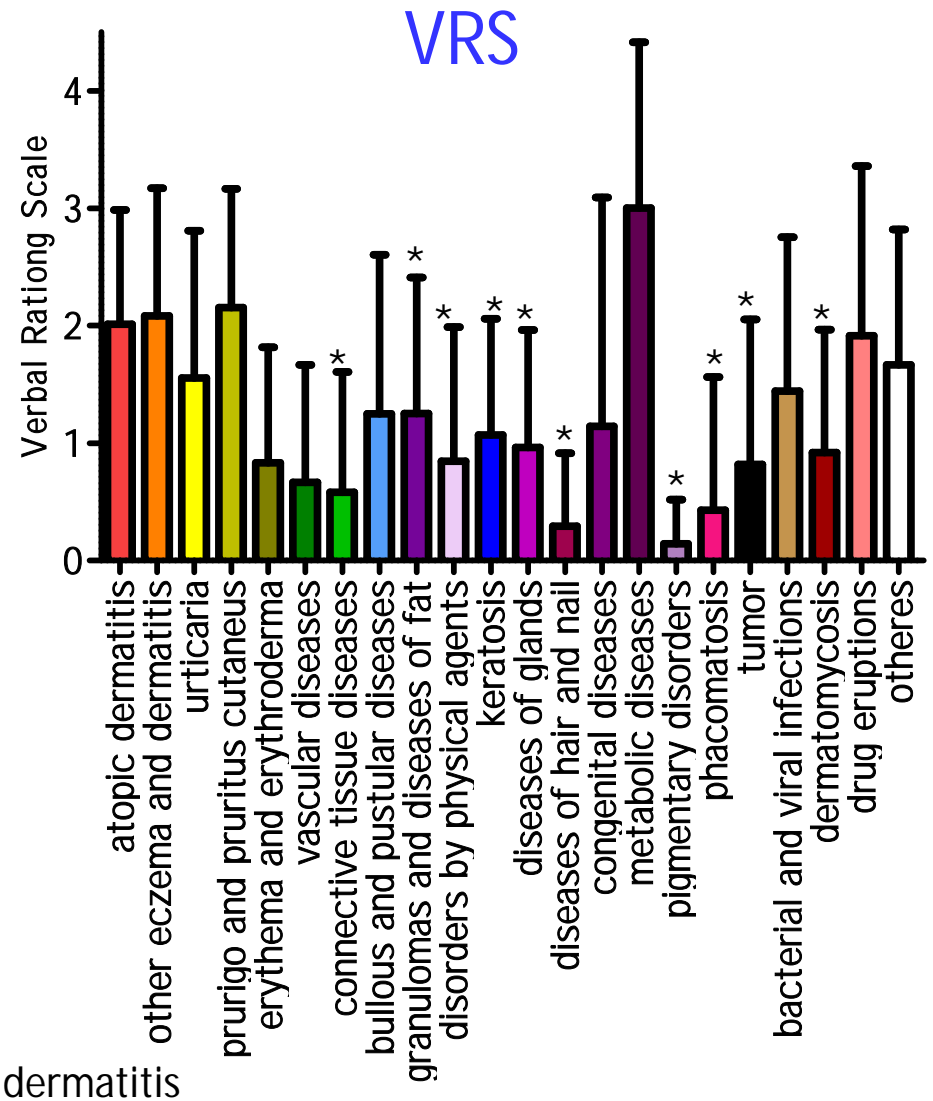
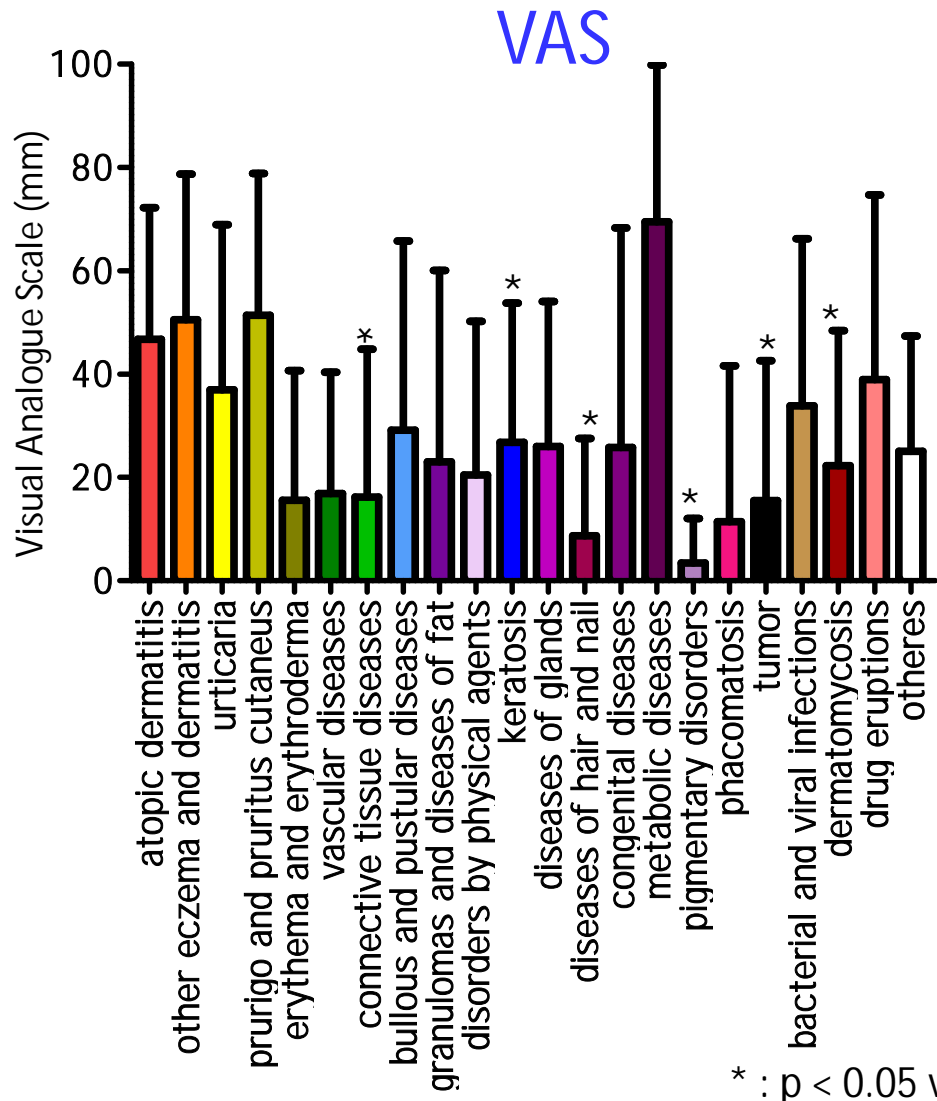
Age of patients did not correlate with the pruritus intensity scoring assessed with VAS or VRS



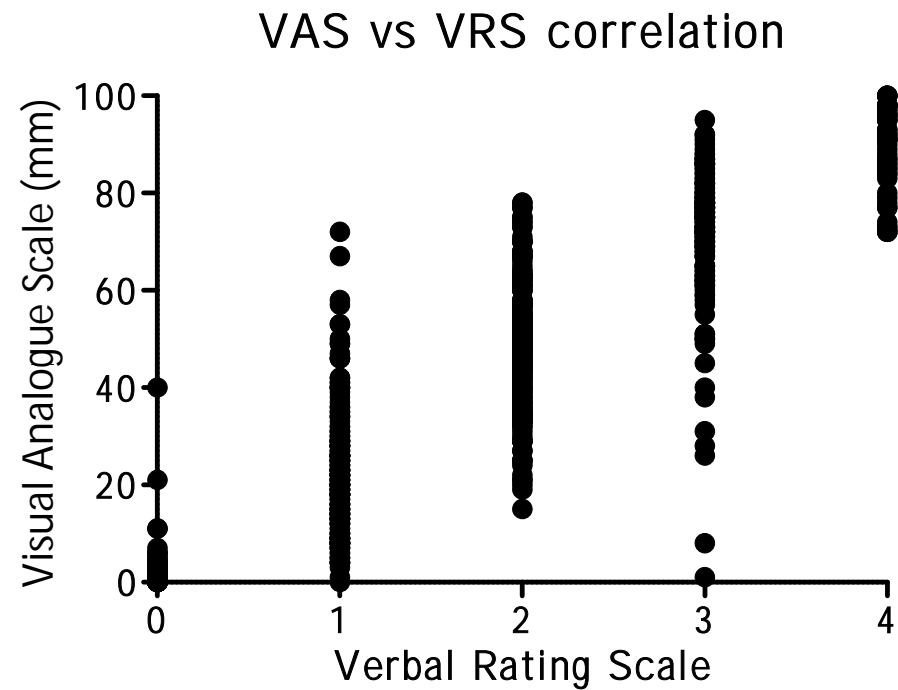
Spearman's rank correlation test $R = -0.07$



$R = -0.09$

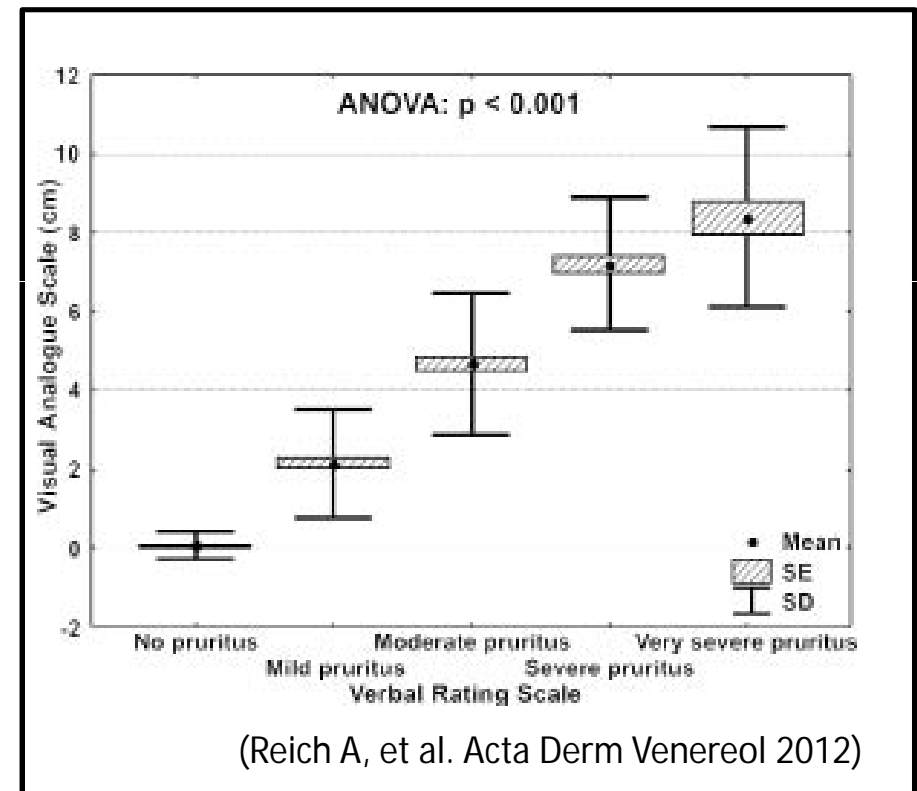
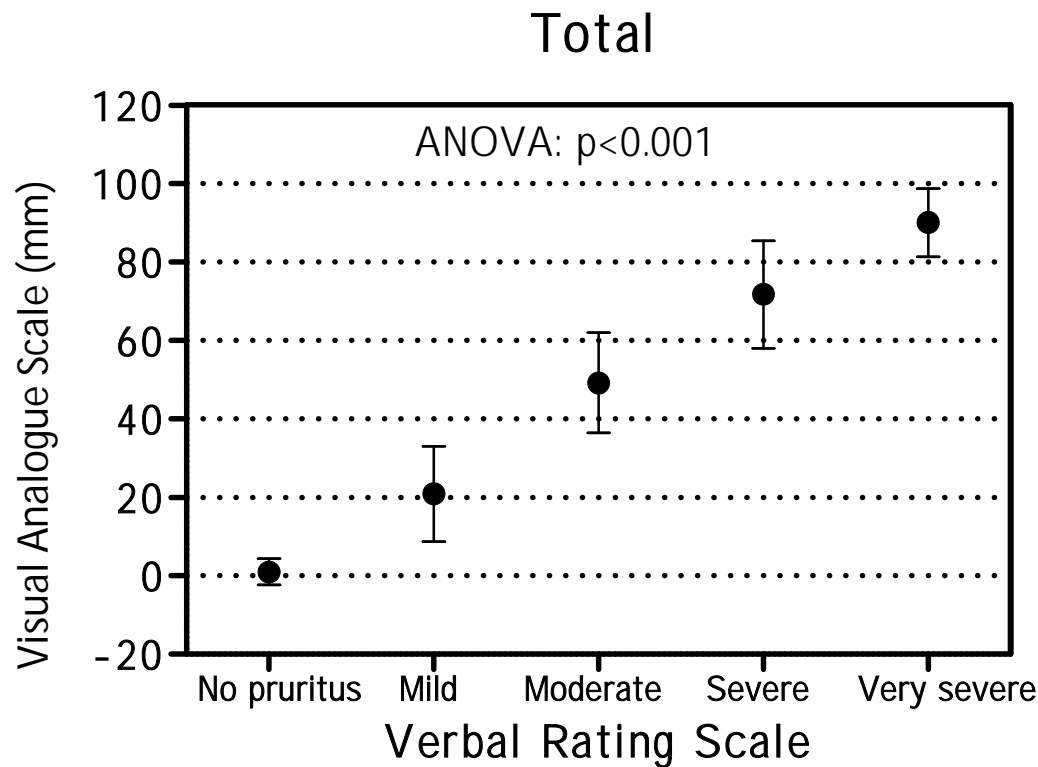


VAS significantly correlated with VRS

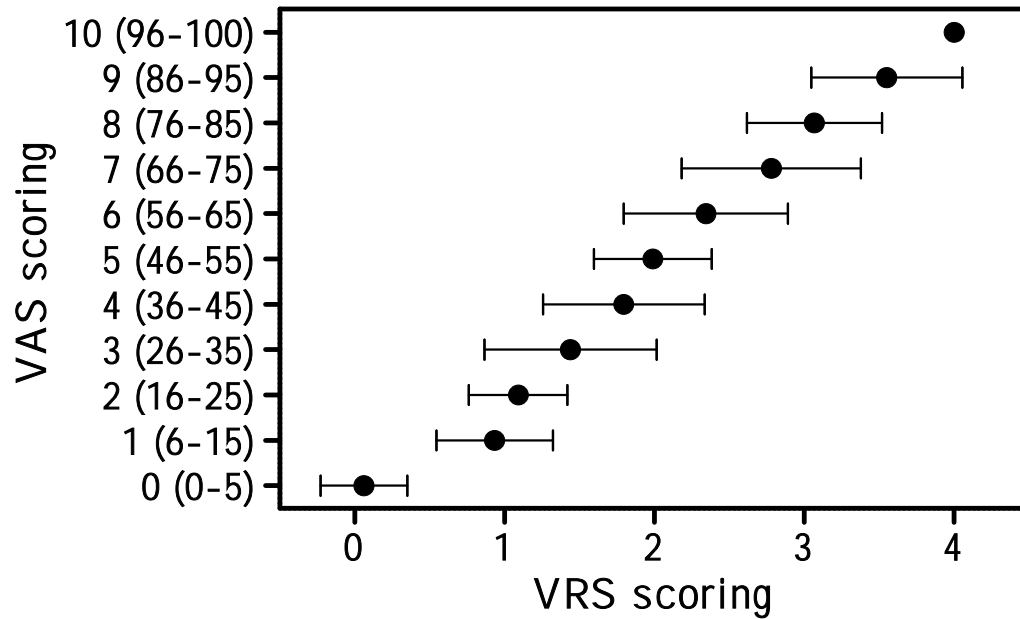


Spearman's rank correlation test $R = 0.94$
 $p < 0.0001$

Each category of VRS differed significantly from the others regarding the VAS scoring



Estimate of the cut-off levels for categorization of VAS



VAS scoring	VRS scoring		
	Mean	Mode	Median
0 (0-5 mm)	0.1 ± 0.3	0	0
1 (6-15 mm)	0.9 ± 0.4	1	1
2 (16-25 mm)	1.1 ± 0.3	1	1
3 (26-35 mm)	1.4 ± 0.6	1	1
4 (36-45 mm)	1.8 ± 0.5	2	2
5 (46-55 mm)	2.0 ± 0.4	2	2
6 (56-65 mm)	2.3 ± 0.5	2	2
7 (66-75 mm)	2.8 ± 0.6	3	3
8 (76-85 mm)	3.1 ± 0.5	3	3
9 (86-95 mm)	3.5 ± 0.5	4	4
10 (96-100 mm)	4.0 ± 0.0	4	4

Verbal Rating Scale (VRS)

- 0: No pruritus
- 1: Mild pruritus
- 2: Moderate pruritus
- 3: Severe pruritus
- 4: Very severe pruritus

<Limits>

- Mild and moderate: 3 or 4 points in VAS
- Moderate and severe: 6 or 7 points in VAS
- Severe and very severe: 8 or 9 points in VAS

Defining the bands of the VAS

Cut-offs of VAS		3-6-8	3-6-9	3-6-8	3-7-9	4-6-8	4-6-9	4-7-8	4-7-9
All subjects	$\kappa(95\%)$	0.56 (0.53-0.59)	0.57 (0.59-0.65)	0.57 (0.54-0.80)	0.64 (0.61-0.67)	0.55 (0.51-0.58)	0.61 (0.58-0.64)	0.56 (0.53-0.59)	0.63 (0.60-0.66)
(n=949)	r	0.92	0.92	0.92	0.92	0.91	0.91	0.9	0.9
Male	$\kappa(95\%)$	0.54 (0.50-0.59)	0.59 (0.54-0.63)	0.55 (0.51-0.60)	0.60 (0.56-0.65)	0.53 (0.49-0.58)	0.58 (0.53-0.63)	0.54 (0.50-0.59)	0.60 (0.55-0.64)
(n=446)	r	0.91	0.91	0.9	0.9	0.89	0.89	0.89	0.89
Female	$\kappa(95\%)$	0.56 (0.52-0.61)	0.65 (0.61-0.69)	0.58 (0.53-0.62)	0.66 (0.62-0.70)	0.56 (0.51-0.90)	0.64 (0.60-0.68)	0.57 (0.52-0.61)	0.66 (0.61-0.70)
(n=503)	r	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.92

Ex: Cut off value (3-6-8) means $0 < \text{mild} < 3$, $3 \leq \text{moderate} < 6$, $6 \leq \text{severe} < 8$, and $8 \leq \text{very severe}$.

- The most suitable set of bands were estimated as (3-7-9) or (4-7-9).
 - The specialist of statistics in our group suggests that (3-7-9) was the most suitable.
- Our results are consistent with the conclusion about the cut-off values (3-7-9) in Caucasian by Dr. Reich et al.

Factor influencing VAS or VRS scores

explanatory variable		VAS			VRS		
		partial regression coefficient	P-value		partial regression coefficient	P-value	
Age		0.016	0.7699		-0.0005	0.8232	
Gender		-3.273	0.0791		0.0942	0.1998	
Disease	Atopic dermatitis	20.6163	0.0000	***	0.8413	0.0000	***
(referent: keratosis)	Eczema and dermatitis	24.7175	0.0000	***	0.9708	0.0000	***
	Urticaria	16.4673	0.0000	***	0.6559	0.0000	***
	Others	-3.7539	0.2253		-0.1856	0.1285	
Facility	Kyoto prefectural U.	0.1573	0.9499		-0.0666	0.4996	
(referent: Kyushu U.)	Miel U.	5.2916	0.0970		0.1624	0.1962	
	Jikei U.	5.7776	0.0188	*	0.2589	0.0076	**

Multiple-regression analysis

Adjusted R²=0.1638

Adjusted R²=0.1764

Summary

- ✓ We assessed the relationship between VAS and VRS in 949 Japanese patients with itchy skin diseases in 4 University Hospitals.
- ✓ VAS significantly correlated with VRS.
- ✓ Each category of VRS differed significantly from the others regarding VAS scoring.
- ✓ Cut-off value (3-7-9), $0 < \text{mild} < 3$, $3 \leq \text{moderate} < 7$, $7 \leq \text{severe} < 9$, and $9 \leq \text{very severe}$, was the most suitable set of bands for VAS.
- ✓ The scores of VAS in each category of VRS and the cut-off value were consistent with previous report by Dr. Reich et al.
- ✓ There were some differences in itch intensity according to skin diseases.
- ✓ There was some regional difference in the expression of itch intensity in Japanese patients.

Conclusion

- VAS and VRS are valuable methods for pruritus measurement.
- The scoring values of these scales may be influenced by some factors including type of skin diseases and living areas of the patients.