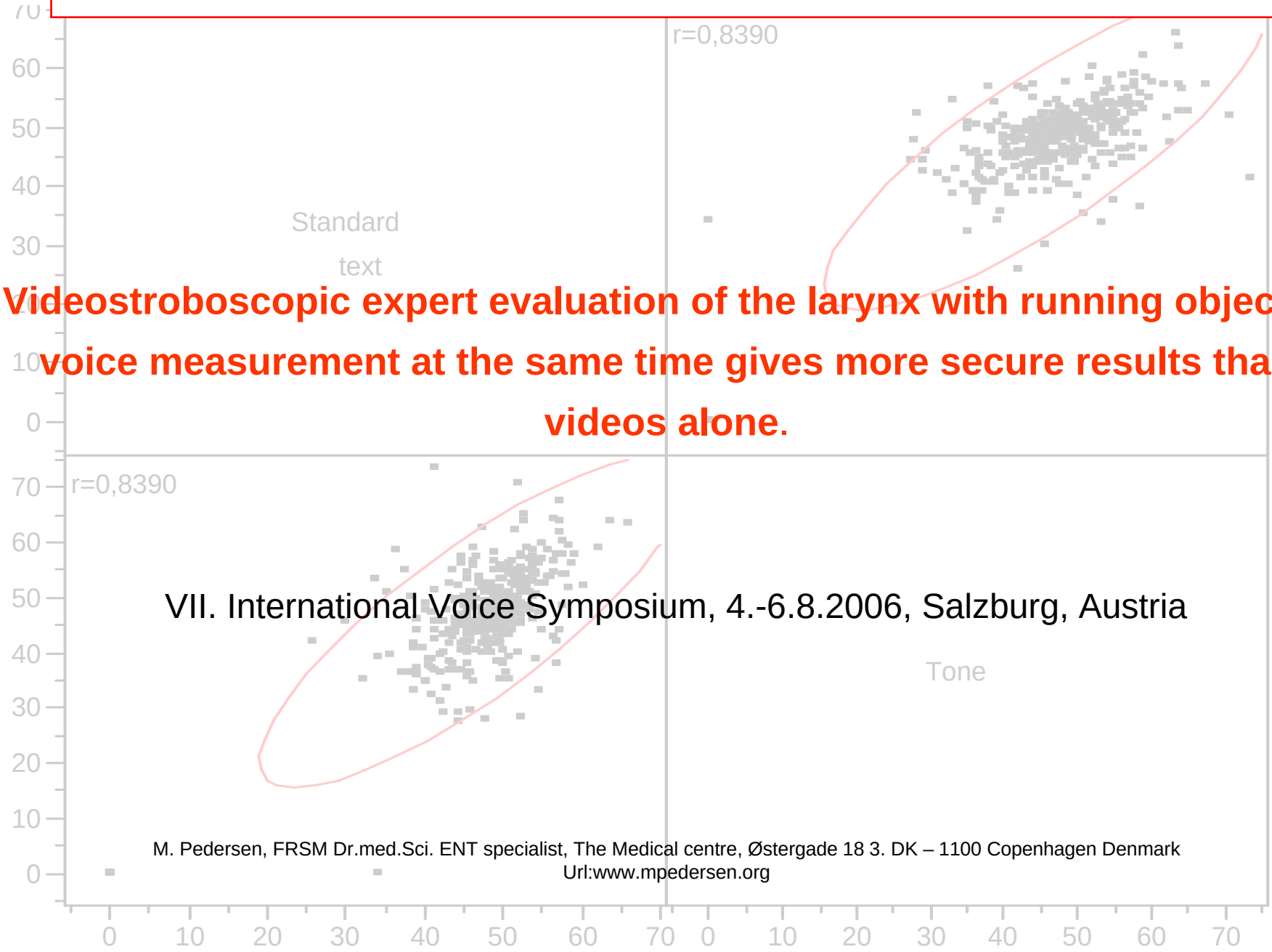
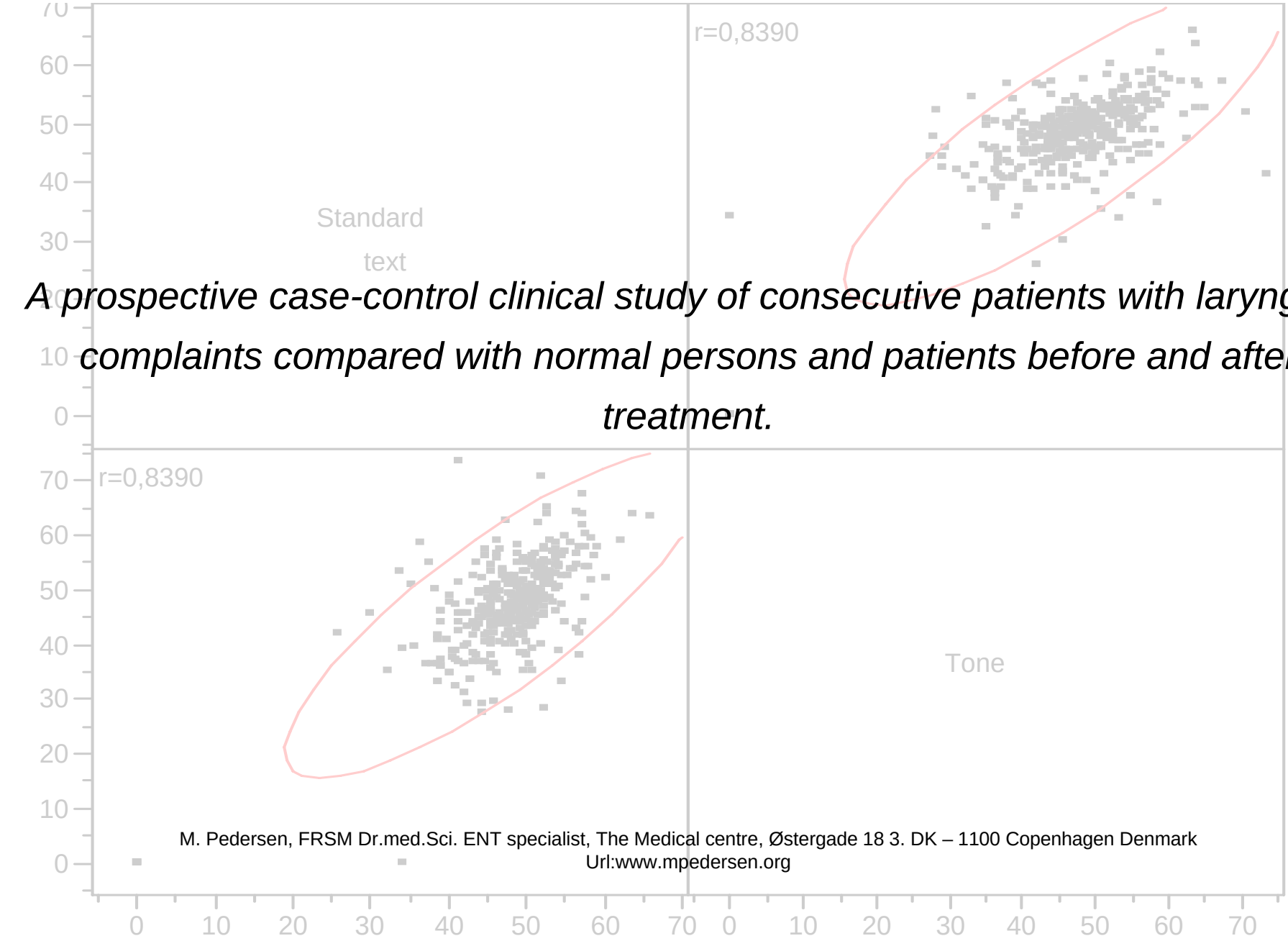
Pedersen M. Yousaf U (2006). Videostroboscopic expert evaluation of the larynx with running objective voice measurement at the same time gives more secure results than videos alone. *VIIth International Voice Symposium, Salzburg, Austria*



Videostroboscopic expert evaluation of the larynx with running objective voice measurement at the same time gives more secure results than videos alone.

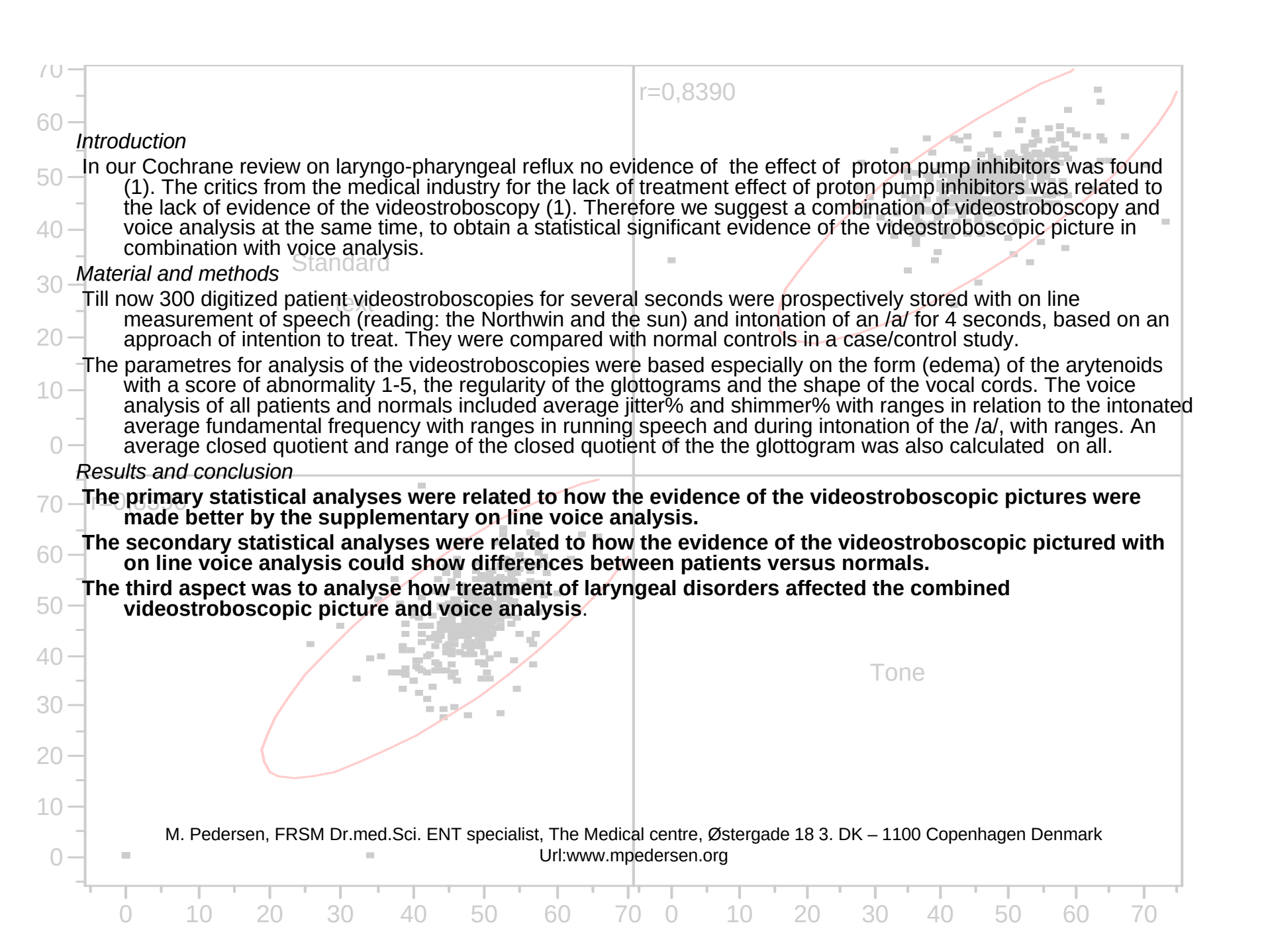
VII. International Voice Symposium, 4.-6.8.2006, Salzburg, Austria

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



A prospective case-control clinical study of consecutive patients with laryngeal complaints compared with normal persons and patients before and after treatment.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



Introduction

In our Cochrane review on laryngo-pharyngeal reflux no evidence of the effect of proton pump inhibitors was found (1). The critics from the medical industry for the lack of treatment effect of proton pump inhibitors was related to the lack of evidence of the videostroboscopy (1). Therefore we suggest a combination of videostroboscopy and voice analysis at the same time, to obtain a statistical significant evidence of the videostroboscopic picture in combination with voice analysis.

Material and methods

Till now 300 digitized patient videostroboscopies for several seconds were prospectively stored with on line measurement of speech (reading: the Northwin and the sun) and intonation of an /a/ for 4 seconds, based on an approach of intention to treat. They were compared with normal controls in a case/control study.

The parametres for analysis of the videostroboscopies were based especially on the form (edema) of the arytenoids with a score of abnormality 1-5, the regularity of the glottograms and the shape of the vocal cords. The voice analysis of all patients and normals included average jitter% and shimmer% with ranges in relation to the intonated average fundamental frequency with ranges in running speech and during intonation of the /a/, with ranges. An average closed quotient and range of the closed quotient of the the glottogram was also calculated on all.

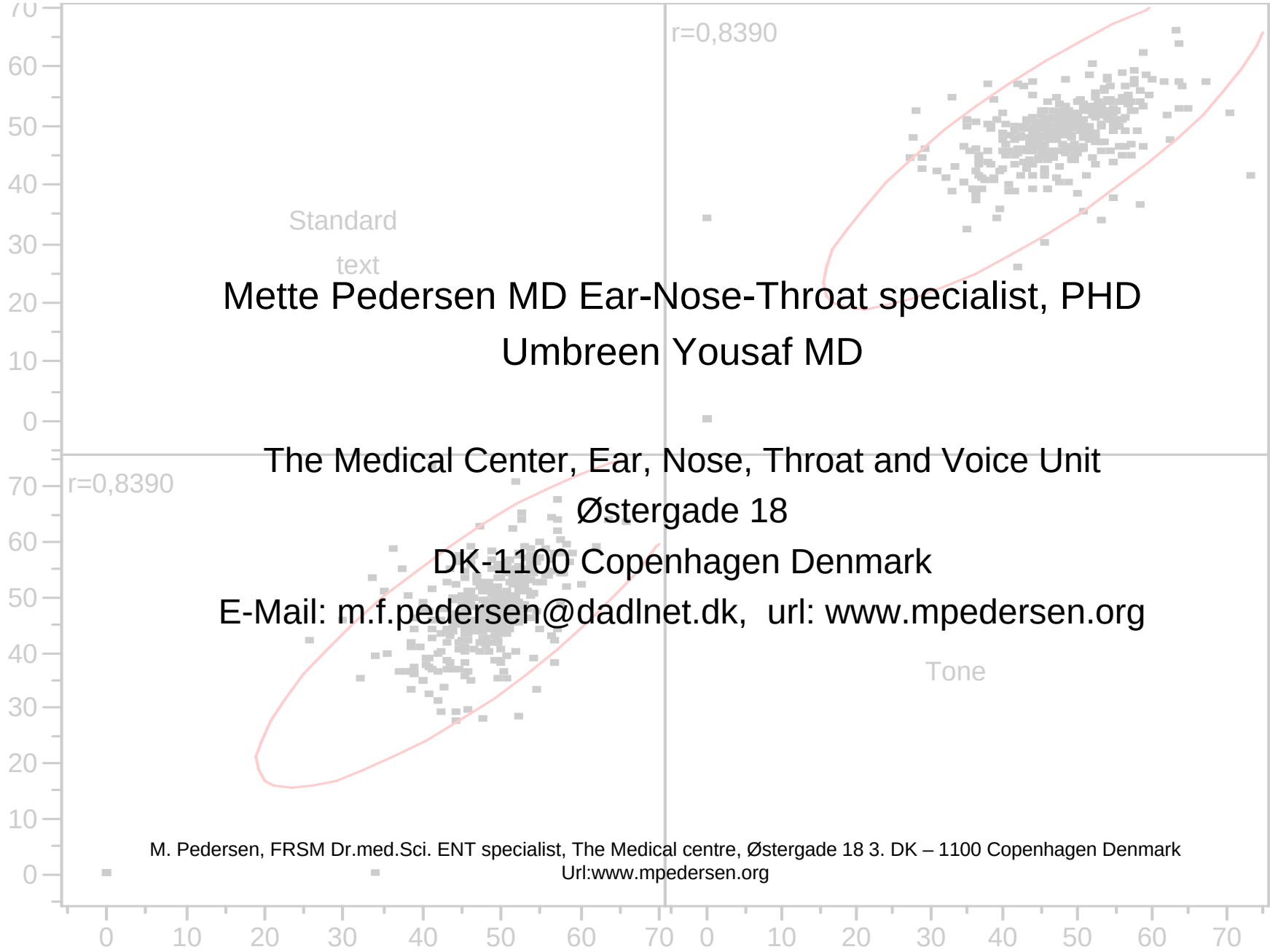
Results and conclusion

The primary statistical analyses were related to how the evidence of the videostroboscopic pictures were made better by the supplementary on line voice analysis.

The secondary statistical analyses were related to how the evidence of the videostroboscopic pictured with on line voice analysis could show differences between patients versus normals.

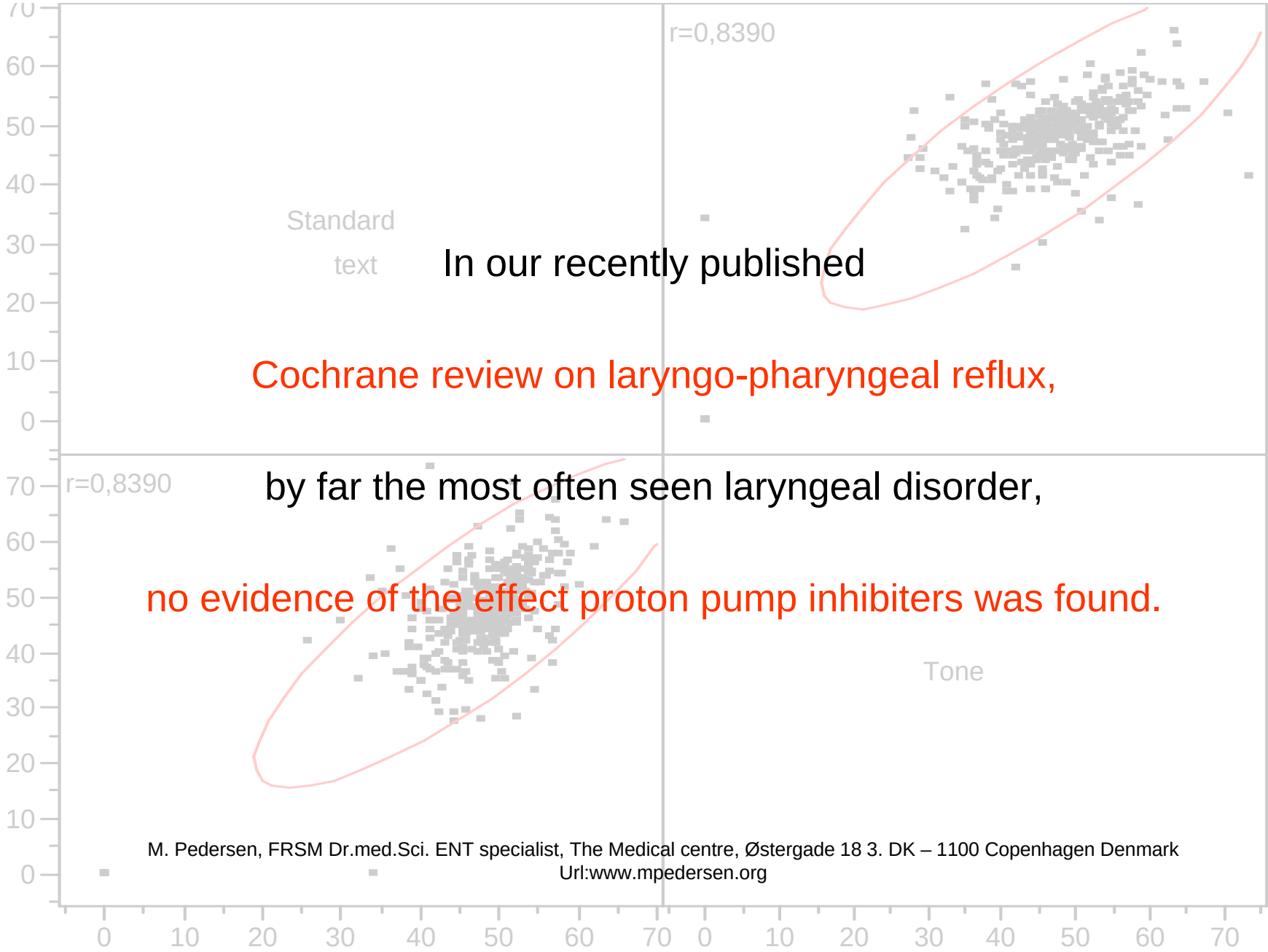
The third aspect was to analyse how treatment of laryngeal disorders affected the combined videostroboscopic picture and voice analysis.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



Mette Pedersen MD Ear-Nose-Throat specialist, PHD
Umbreen Yousaf MD

The Medical Center, Ear, Nose, Throat and Voice Unit
Østergade 18
DK-1100 Copenhagen Denmark
E-Mail: m.f.pedersen@dadlnet.dk, url: www.mpedersen.org



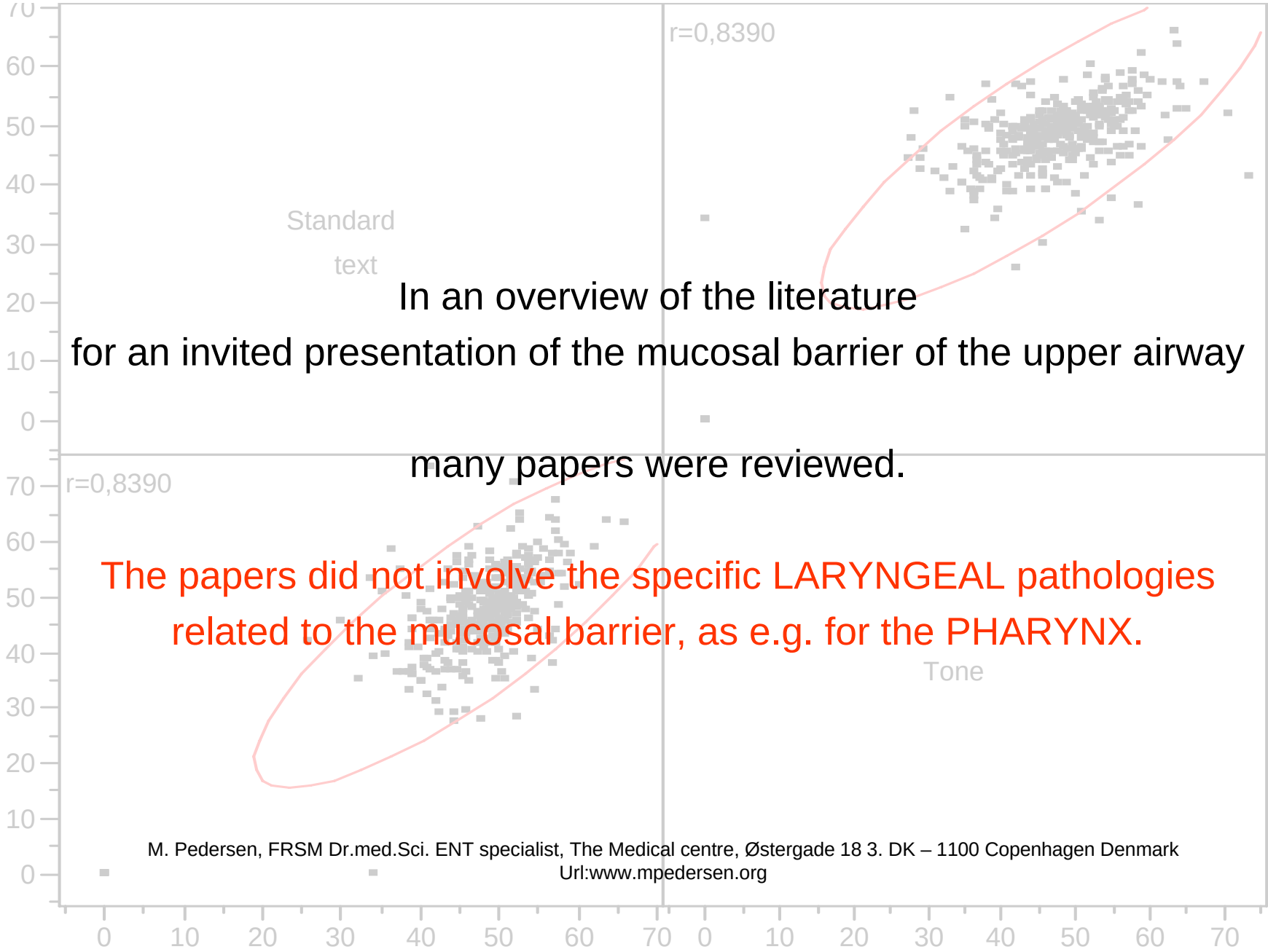
In our recently published

Cochrane review on laryngo-pharyngeal reflux,

by far the most often seen laryngeal disorder,

no evidence of the effect proton pump inhibiters was found.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



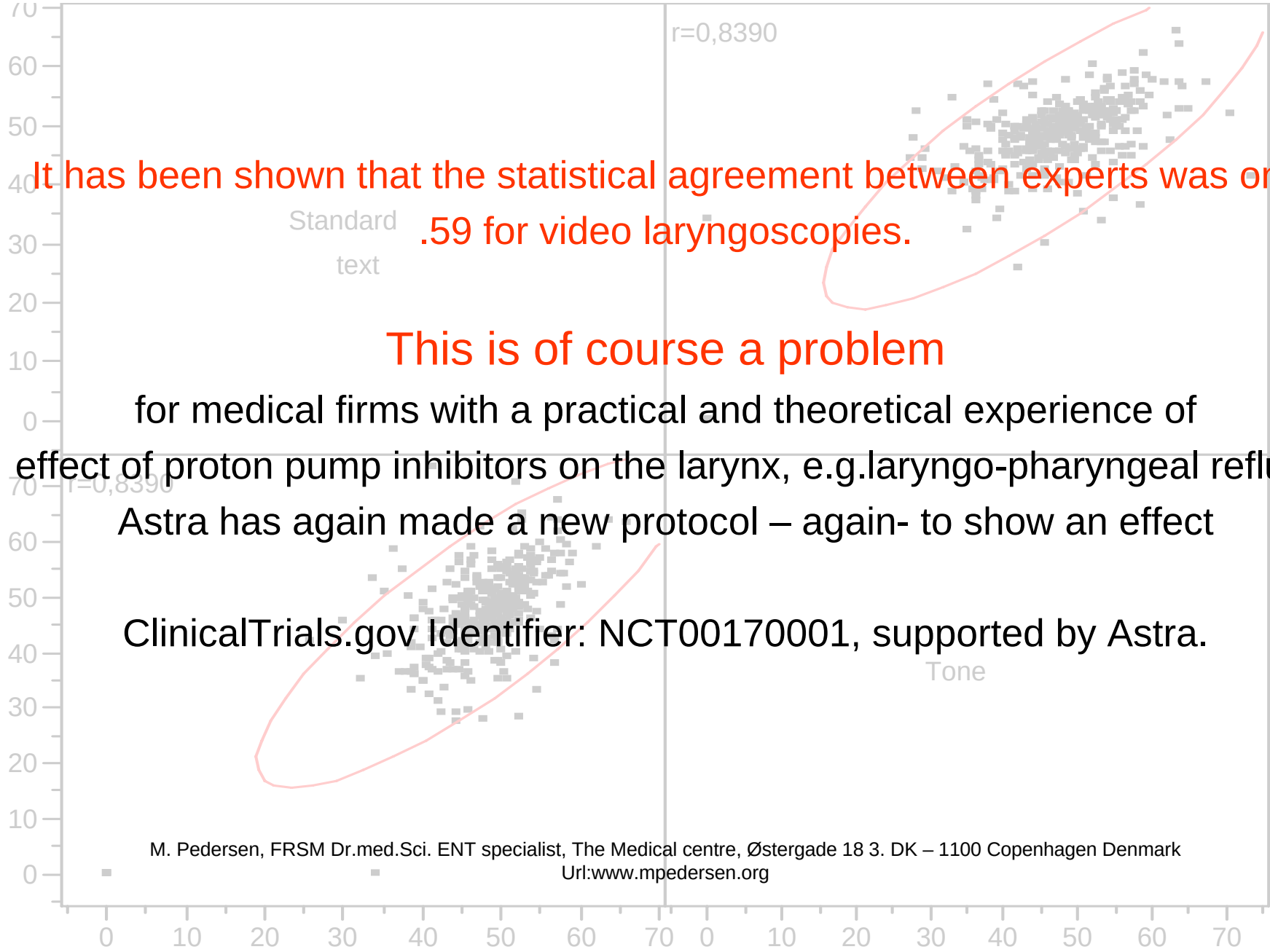
In an overview of the literature

for an invited presentation of the mucosal barrier of the upper airway

many papers were reviewed.

The papers did not involve the specific LARYNGEAL pathologies related to the mucosal barrier, as e.g. for the PHARYNX.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



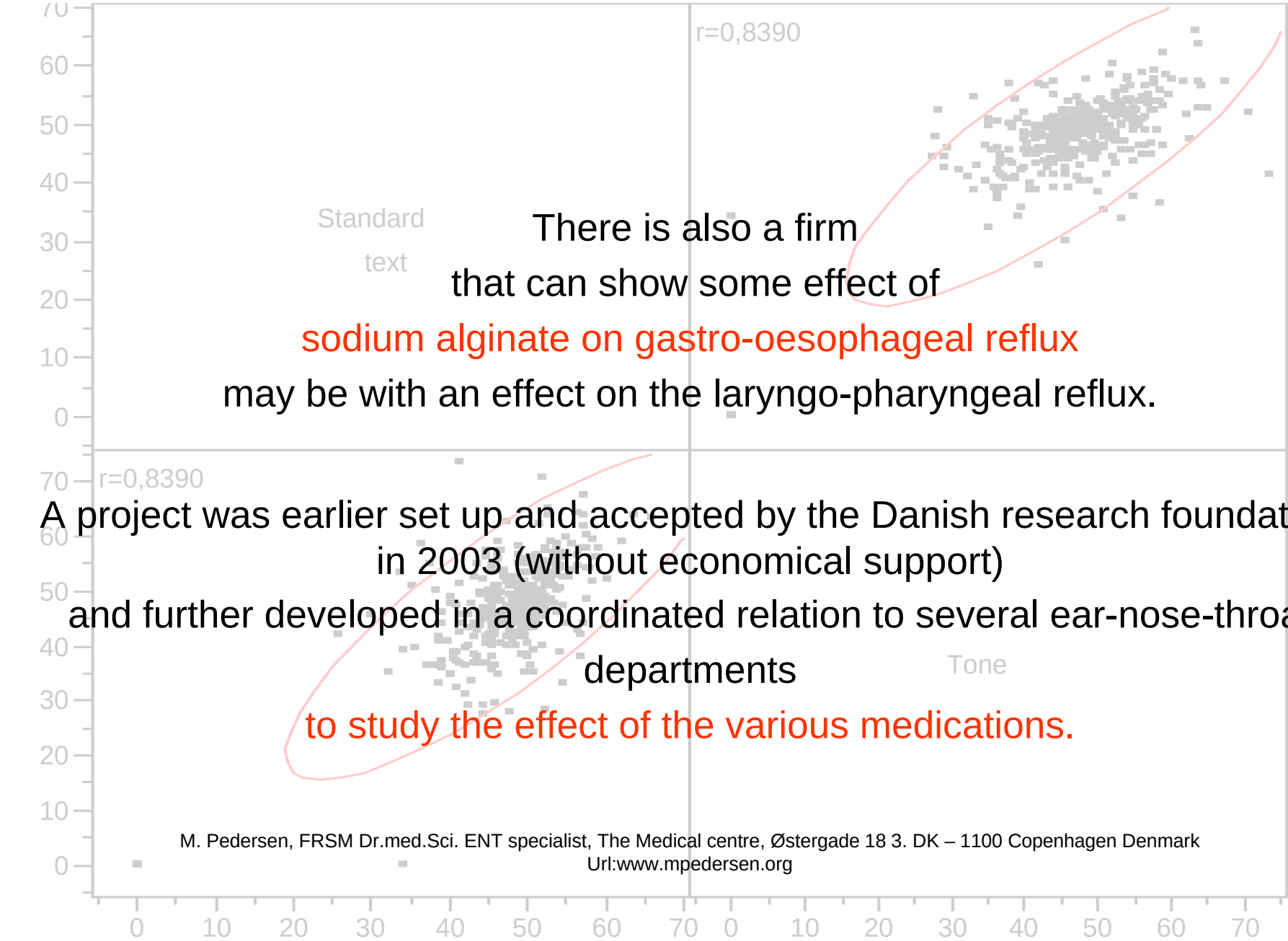
It has been shown that the statistical agreement between experts was only .59 for video laryngoscopies.

This is of course a problem

for medical firms with a practical and theoretical experience of effect of proton pump inhibitors on the larynx, e.g.laryngo-pharyngeal reflux. Astra has again made a new protocol – again- to show an effect

ClinicalTrials.gov Identifier: NCT00170001, supported by Astra.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



There is also a firm

that can show some effect of

sodium alginate on gastro-oesophageal reflux

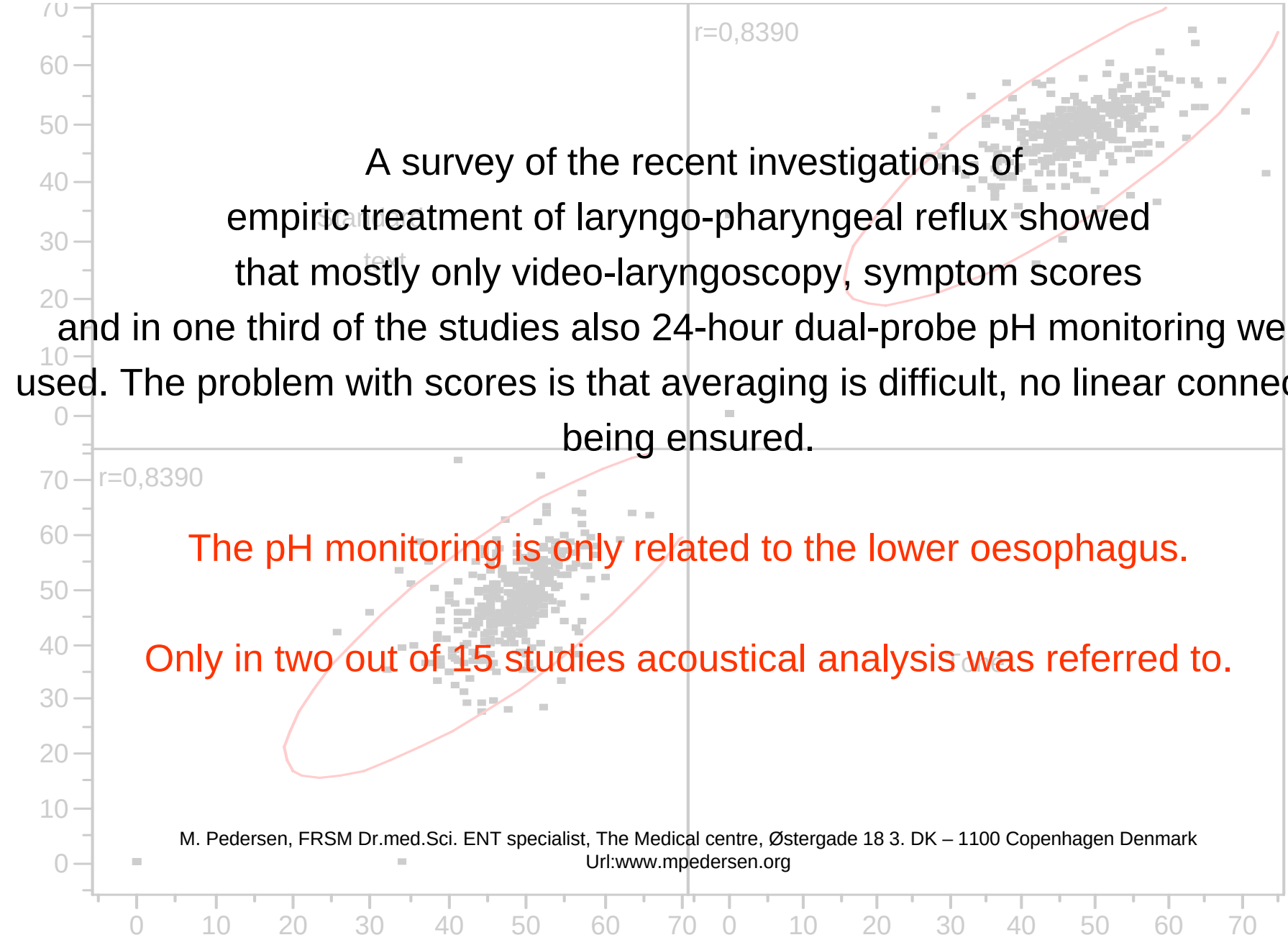
may be with an effect on the laryngo-pharyngeal reflux.

A project was earlier set up and accepted by the Danish research foundation in 2003 (without economical support)

and further developed in a coordinated relation to several ear-nose-throat departments

to study the effect of the various medications.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

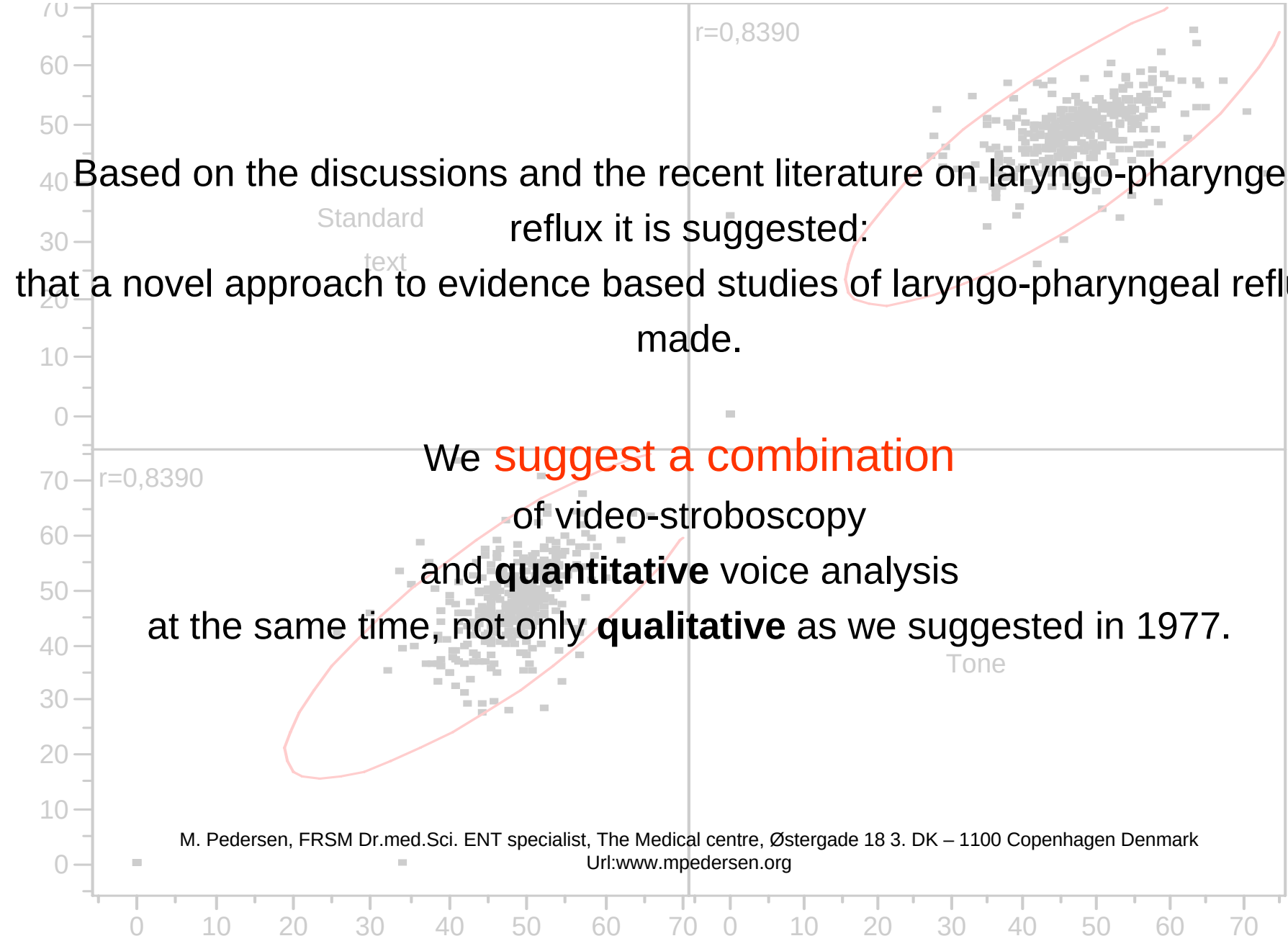


A survey of the recent investigations of empiric treatment of laryngo-pharyngeal reflux showed that mostly only video-laryngoscopy, symptom scores and in one third of the studies also 24-hour dual-probe pH monitoring were used. The problem with scores is that averaging is difficult, no linear connection being ensured.

The pH monitoring is only related to the lower oesophagus.

Only in two out of 15 studies acoustical analysis was referred to.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



Based on the discussions and the recent literature on laryngo-pharyngeal reflux it is suggested:

that a novel approach to evidence based studies of laryngo-pharyngeal reflux is made.

We suggest a combination

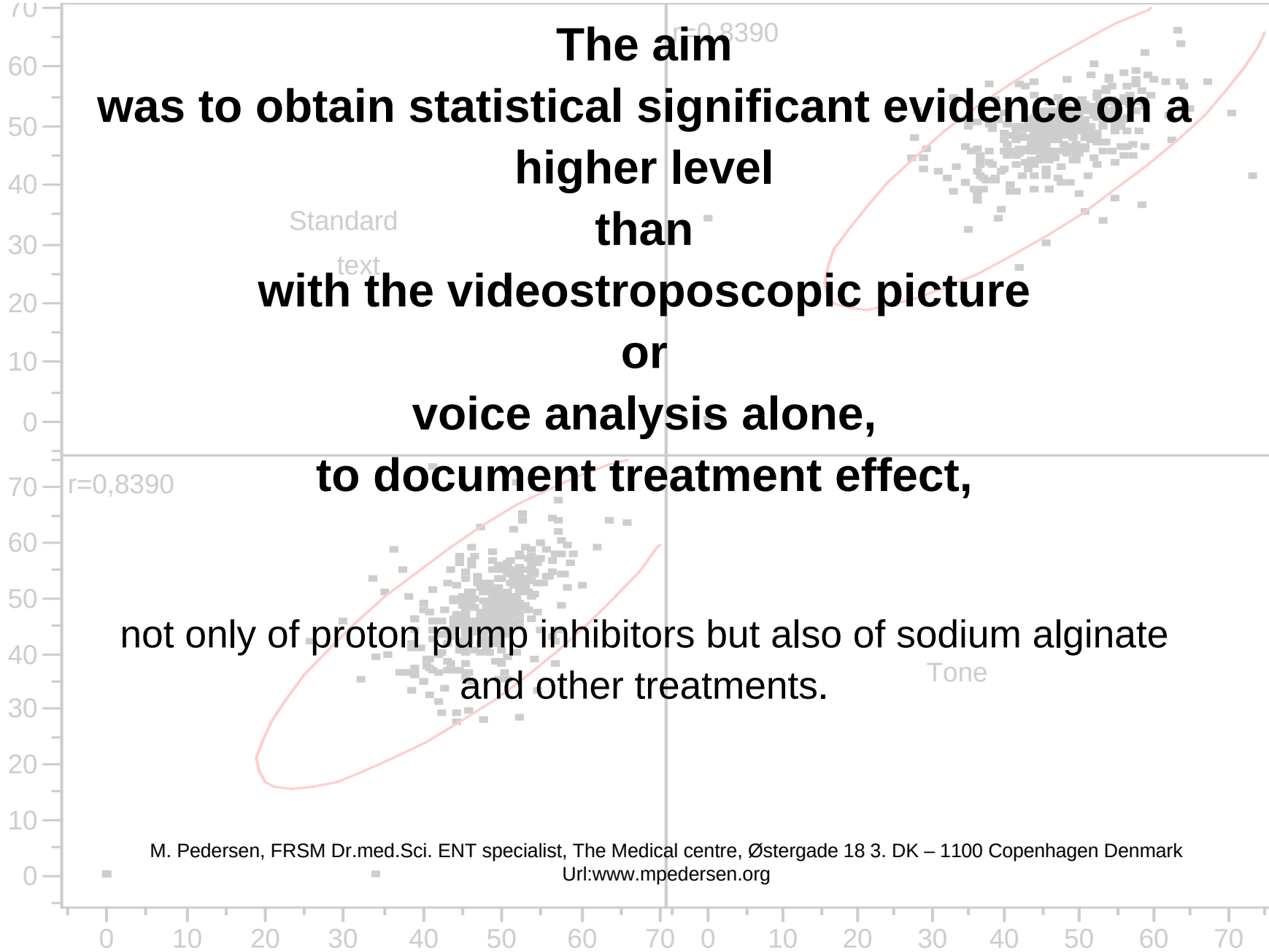
of video-stroboscopy

and **quantitative** voice analysis

at the same time, not only **qualitative** as we suggested in 1977.

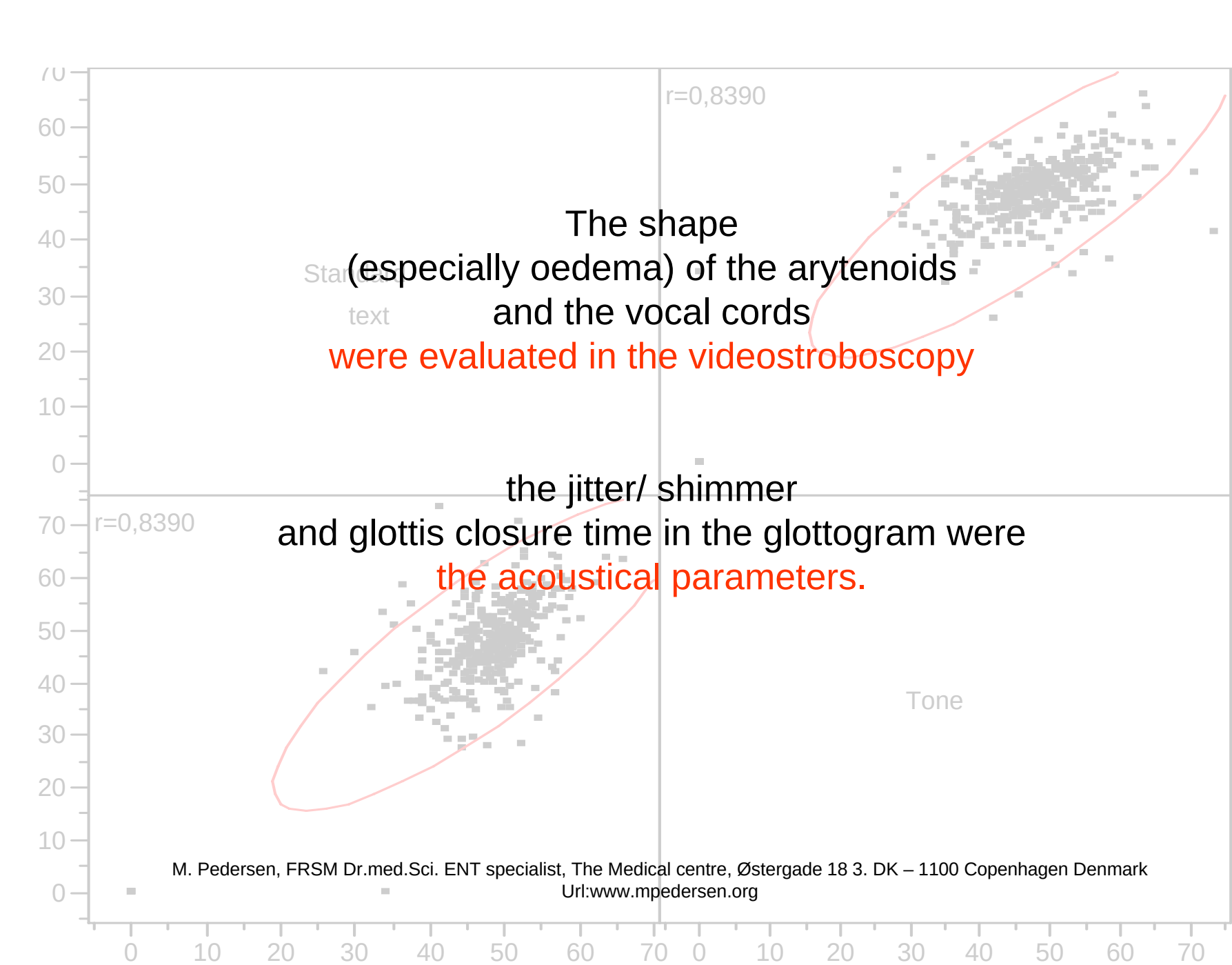
M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

The aim
was to obtain statistical significant evidence on a higher level
than
with the videostroposcopic picture
or
voice analysis alone,
to document treatment effect,



not only of proton pump inhibitors but also of sodium alginate and other treatments.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



The shape
(especially oedema) of the arytenoids
and the vocal cords
were evaluated in the videostroboscopy

the jitter/ shimmer
and glottis closure time in the glottogram were
the acoustical parameters.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Table 1

Table 1 A. intonation of a sustained tone /ah/.

Five different groups of consecutive digitized video-stroboscopies

evaluated by 2-3 observers on the spot,

based on the pathology /oedema and shape of the arythenoids and vocal cords

and voice analysis at the same time

grade 1=normal larynx without laryngeal complaints,

grade 5=maximal oedema of the arythenoids and other abnormalities

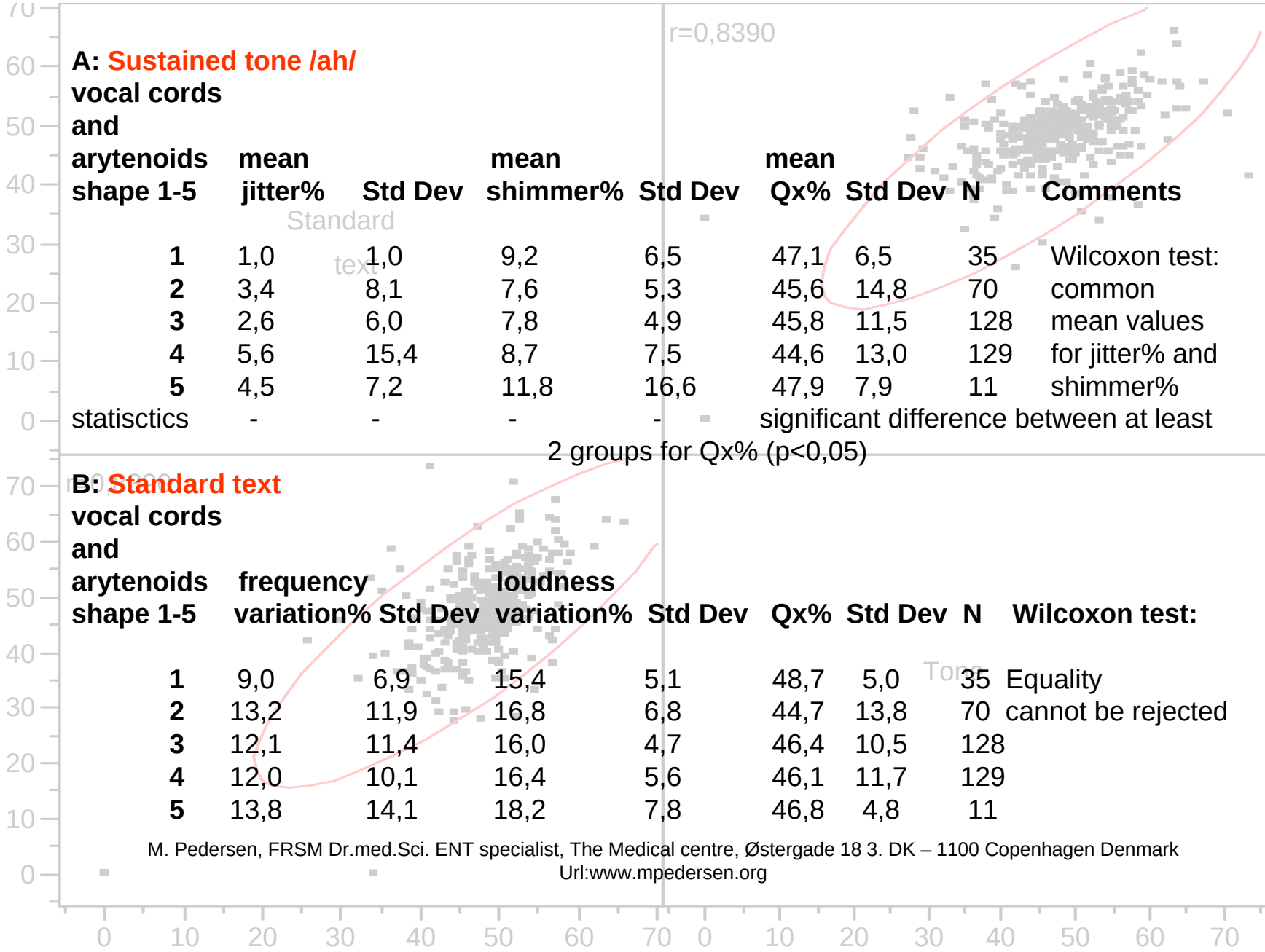
Comparison is made with jitter%, shimmer% and glottis closure time, Qx%

measured with SPEAD by the firm Laryngograph ltd.

Table 1 B. a standard text

Description of frequency, loudness and glottis closure variation in % by reading of the text: The North win and the sun at the same time on the same population.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



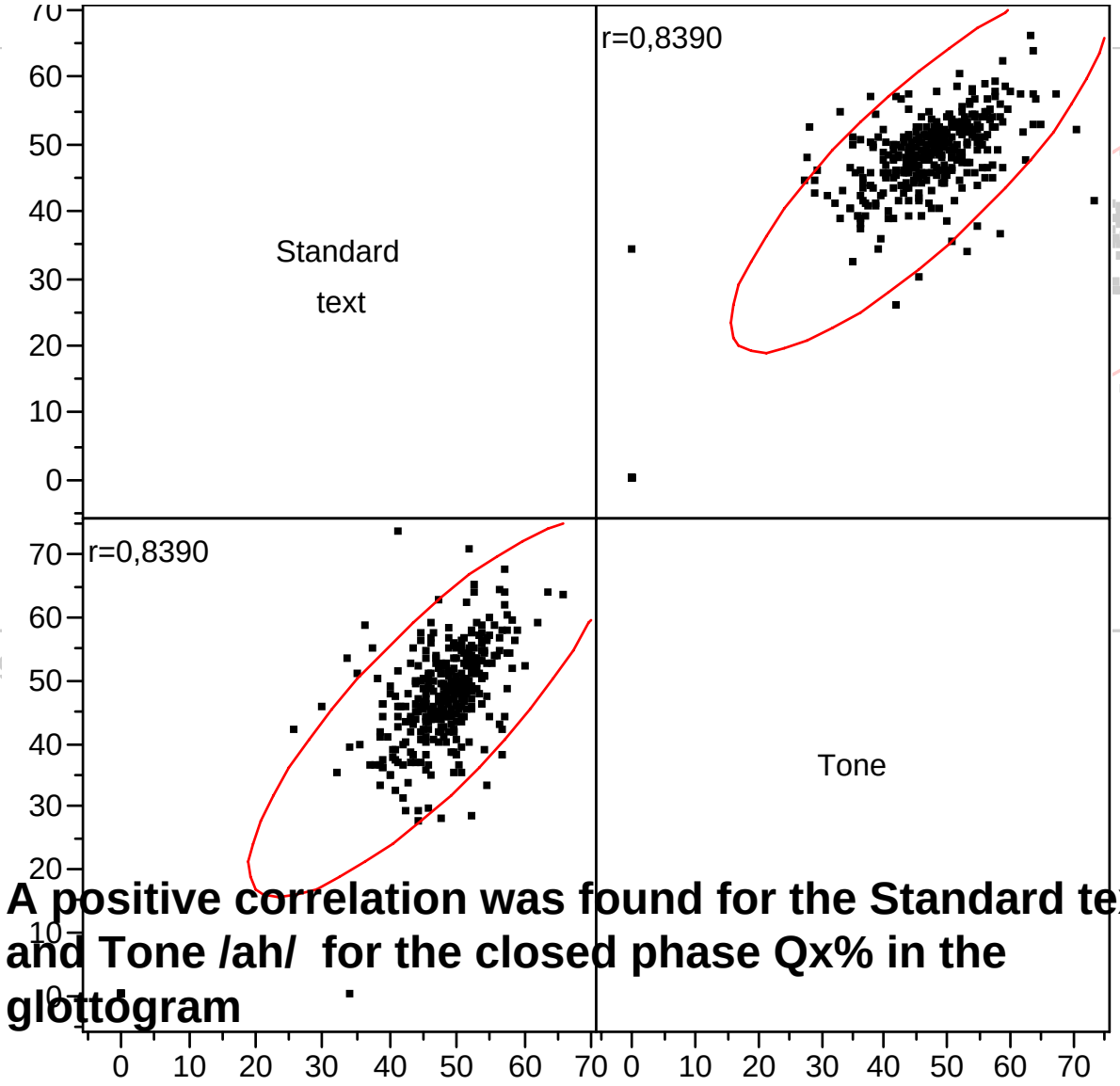
A: Sustained tone /ah/

vocal cords and arytenoids shape 1-5	mean jitter%	Std Dev	mean shimmer%	Std Dev	mean Qx%	Std Dev	N	Comments
1	1,0	1,0	9,2	6,5	47,1	6,5	35	Wilcoxon test:
2	3,4	8,1	7,6	5,3	45,6	14,8	70	common
3	2,6	6,0	7,8	4,9	45,8	11,5	128	mean values
4	5,6	15,4	8,7	7,5	44,6	13,0	129	for jitter% and
5	4,5	7,2	11,8	16,6	47,9	7,9	11	shimmer%
statisctics	-	-	-	-	significant difference between at least 2 groups for Qx% (p<0,05)			

B: Standard text

vocal cords and arytenoids shape 1-5	frequency variation%	Std Dev	loudness variation%	Std Dev	Qx%	Std Dev	N	Wilcoxon test:
1	9,0	6,9	15,4	5,1	48,7	5,0	35	Equality
2	13,2	11,9	16,8	6,8	44,7	13,8	70	cannot be rejected
3	12,1	11,4	16,0	4,7	46,4	10,5	128	
4	12,0	10,1	16,4	5,6	46,1	11,7	129	
5	13,8	14,1	18,2	7,8	46,8	4,8	11	

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



A positive correlation was found for the Standard text and Tone /ah/ for the closed phase Qx% in the glottogram

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Statistics based on table 1

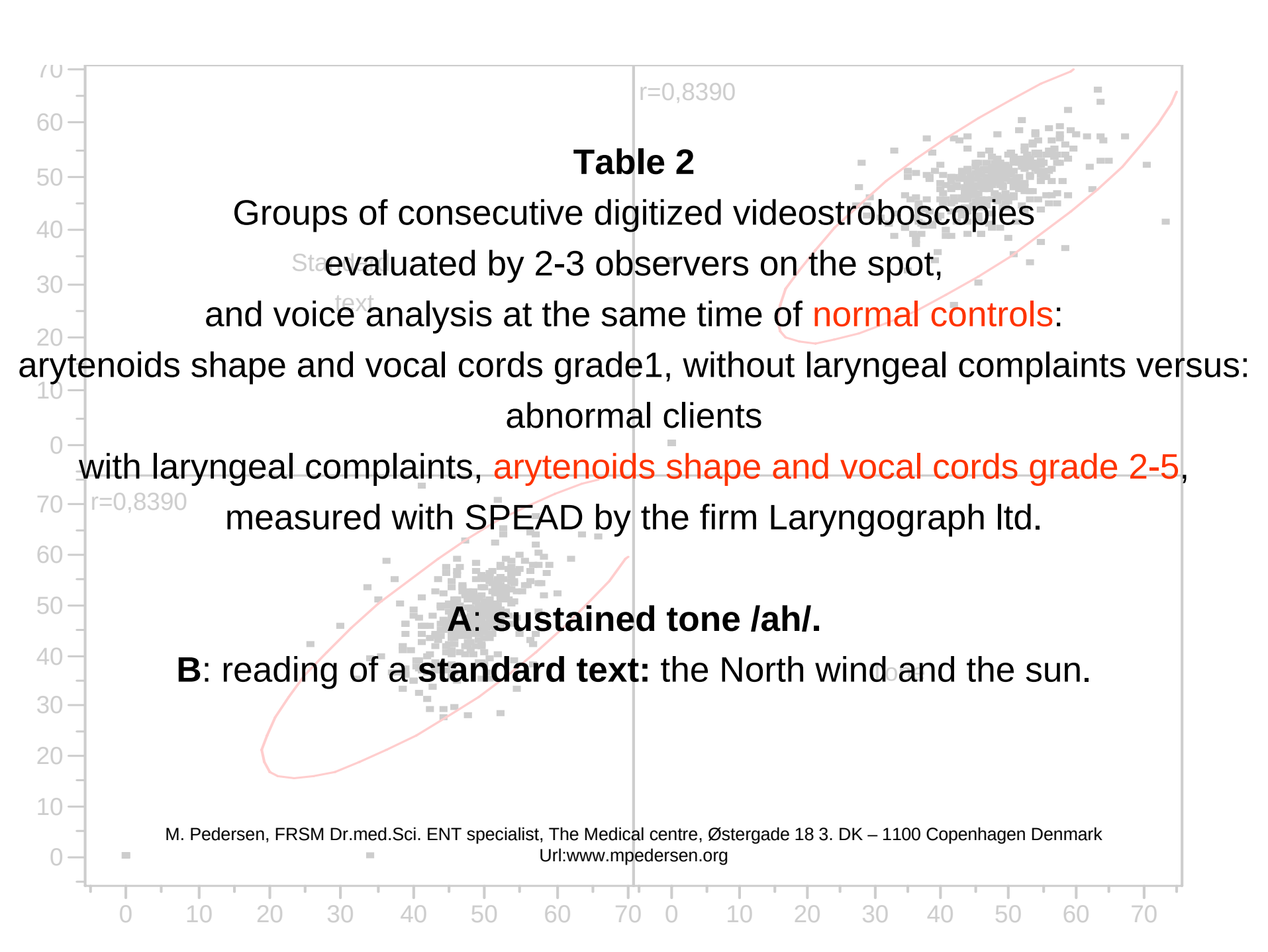


Table 2

Groups of consecutive digitized videostroboscopies
evaluated by 2-3 observers on the spot,
and voice analysis at the same time of normal controls:
arytenoids shape and vocal cords grade1, without laryngeal complaints versus:
abnormal clients
with laryngeal complaints, arytenoids shape and vocal cords grade 2-5,
measured with SPEAD by the firm Laryngograph ltd.

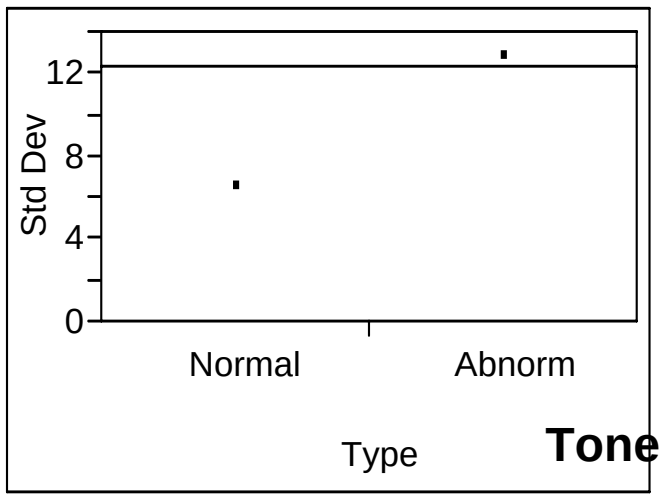
A: **sustained tone /ah/.**

B: reading of a **standard text:** the North wind and the sun.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Table 2 A:

vocal cords and arytenoids shape 1	mean jitter%	Std Dev	mean shimmer%	Std Dev	mean Qx%	Std Dev	N	Comments
	1	1	9,2	6,5	47,1	6,5	35	
shape 2-5	4	10,5	8,2	6,6	45,3	12,7	338	
statistics	-	-	-	-				



Tone /ah/ Qx%

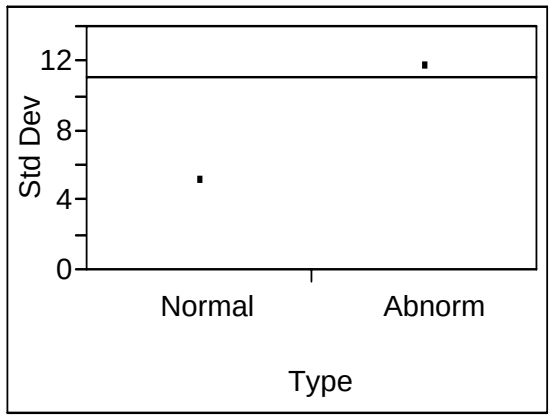
significant difference for Qx% and standard deviations between normal and abnormal measures, Welch ANOVA p<0,0001

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Table 2 B Standard text Qx%: vocal folds and arytenoids

shape 1	frequency variation%	Std Dev	loudness variation%	Std Dev	Qx%	Std Dev	N	
	9	6,9	15,4	5,1	48,7	6,5	35	for frequency variation % normals<6,9 abnormal >11,1%
shape 2-5	12,3	11,1	16,4	5,6	46,0	11,4	338	
statistics -	p 0,03 *				p 0,011 *			normals versus abnormals l SD Qx% <6,5 SD %>11.4

*p as given (Wilcoxon test)



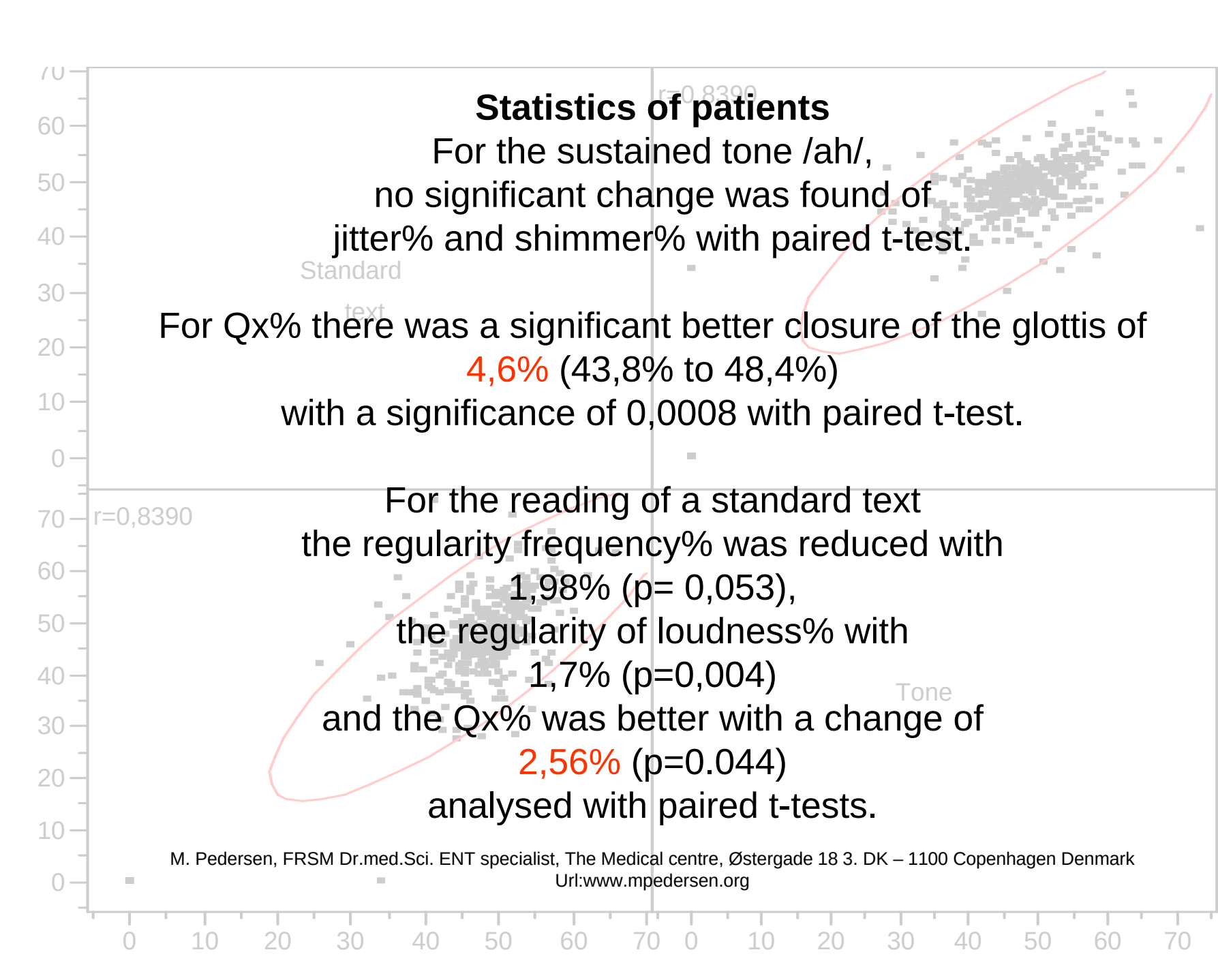
Standard text Qx%

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Table 3 A:
77 patients with examinations before and after treatment,
Intonation of a sustained tone /ah/.
Vocal cords and arytenoids abnormality

	(shape 5 1 pt.)		(shape 5 3 ptt.)		
shape 4	**1. examination**	**Std Dev**	**2. examination**	**Std Dev**	**N 1st 32/ 2nd.25**
mean jitter%	5.7	17.9	1,1	1,1	
mean shimmer%	7,4	5,2	6,8	3,7	
mean Qx%	43,7	14,4	48,1	6,1	
shape 3	**1.examination**	**Std Dev**	**2. examination**	**Std Dev**	**N 1st 26/ 2nd30**
mean jitter%	3,8	8,7	1,6	3,0	
mean shimmer%	7,4	3,9	7,3	3,6	
mean Qx%	42,3	14,5	48,1	7,1	
shape 2	**1.examination**	**Std Dev**	**2. examination**	**Std Dev**	**N 1st 16/ 2nd18**
mean jitter%	4,9	11,1	2,2	3,3	
mean shimmer%	4,9	8,7	1,6	3,1	
mean Qx%	45,4	7,5	50,3	9,2	
	(shape 1 2 ptt.)		(shape 1 1 pt).		

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



Statistics of patients

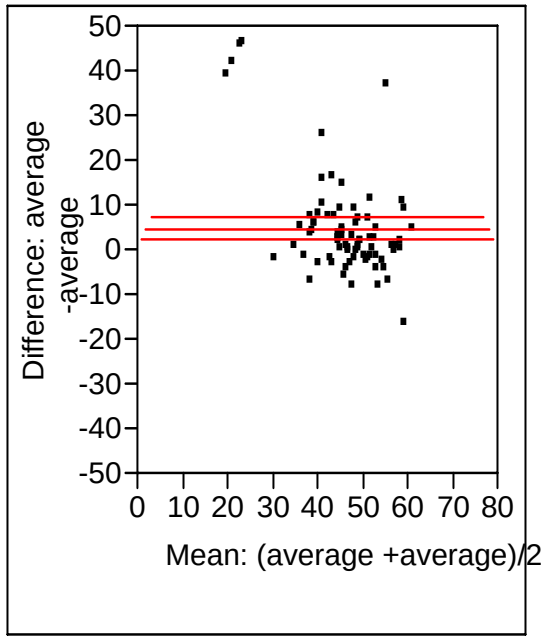
For the sustained tone /ah/,
no significant change was found of
jitter% and shimmer% with paired t-test.

For Qx% there was a significant better closure of the glottis of
4,6% (43,8% to 48,4%)
with a significance of 0,0008 with paired t-test.

For the reading of a standard text
the regularity frequency% was reduced with
1,98% (p= 0,053),
the regularity of loudness% with
1,7% (p=0,004)
and the Qx% was better with a change of
2,56% (p=0.044)
analysed with paired t-tests.

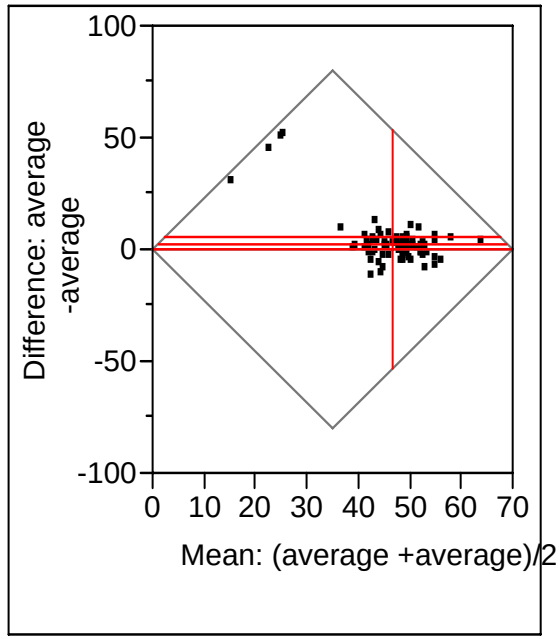
M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org

Tone /ah/ Qx%

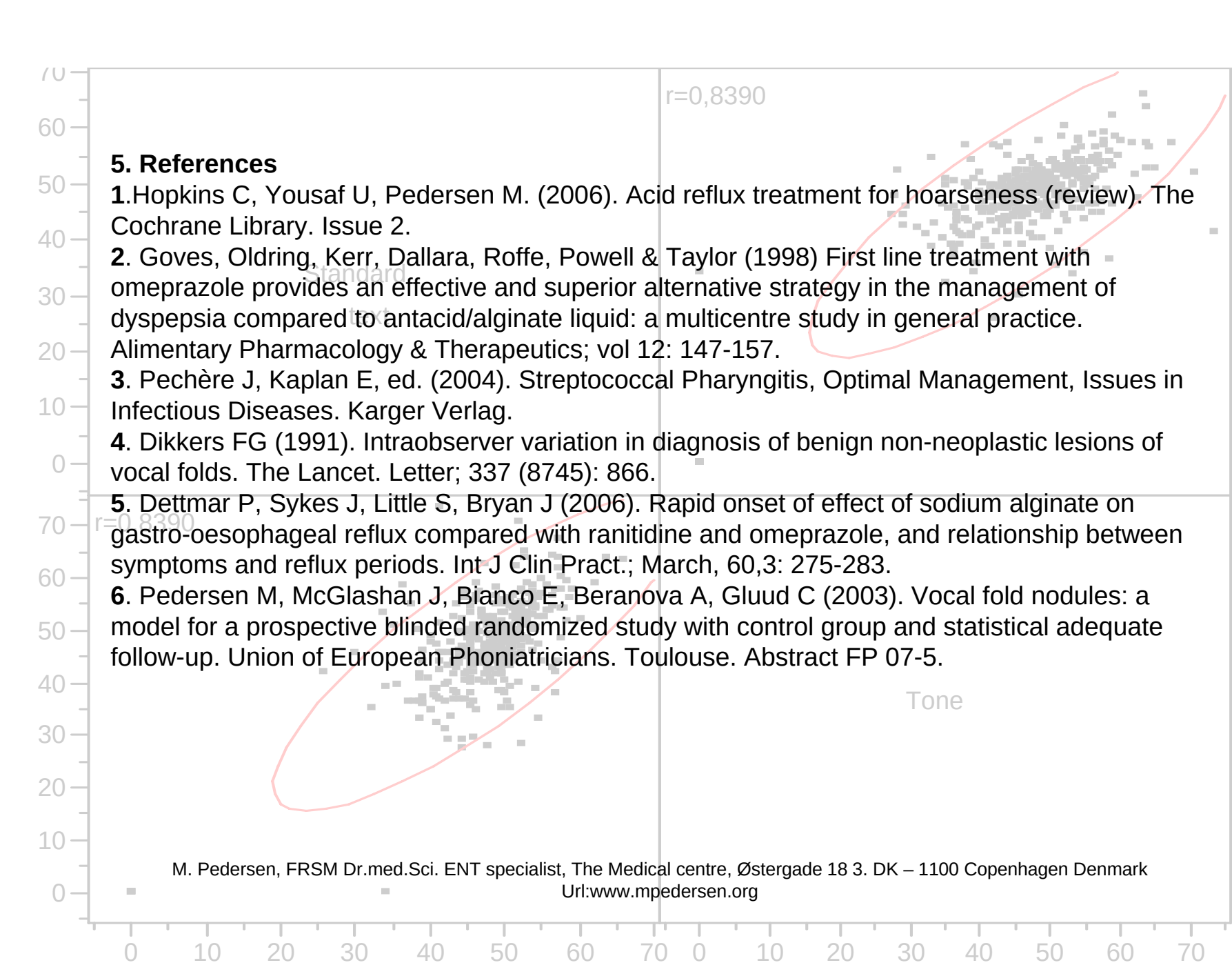


average med 1 decimal 3

Standard text Qx%



M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



5. References

1.Hopkins C, Yousaf U, Pedersen M. (2006). Acid reflux treatment for hoarseness (review). The Cochrane Library. Issue 2.

2. Goves, Oldring, Kerr, Dallara, Roffe, Powell & Taylor (1998) First line treatment with omeprazole provides an effective and superior alternative strategy in the management of dyspepsia compared to antacid/alginate liquid: a multicentre study in general practice. Alimentary Pharmacology & Therapeutics; vol 12: 147-157.

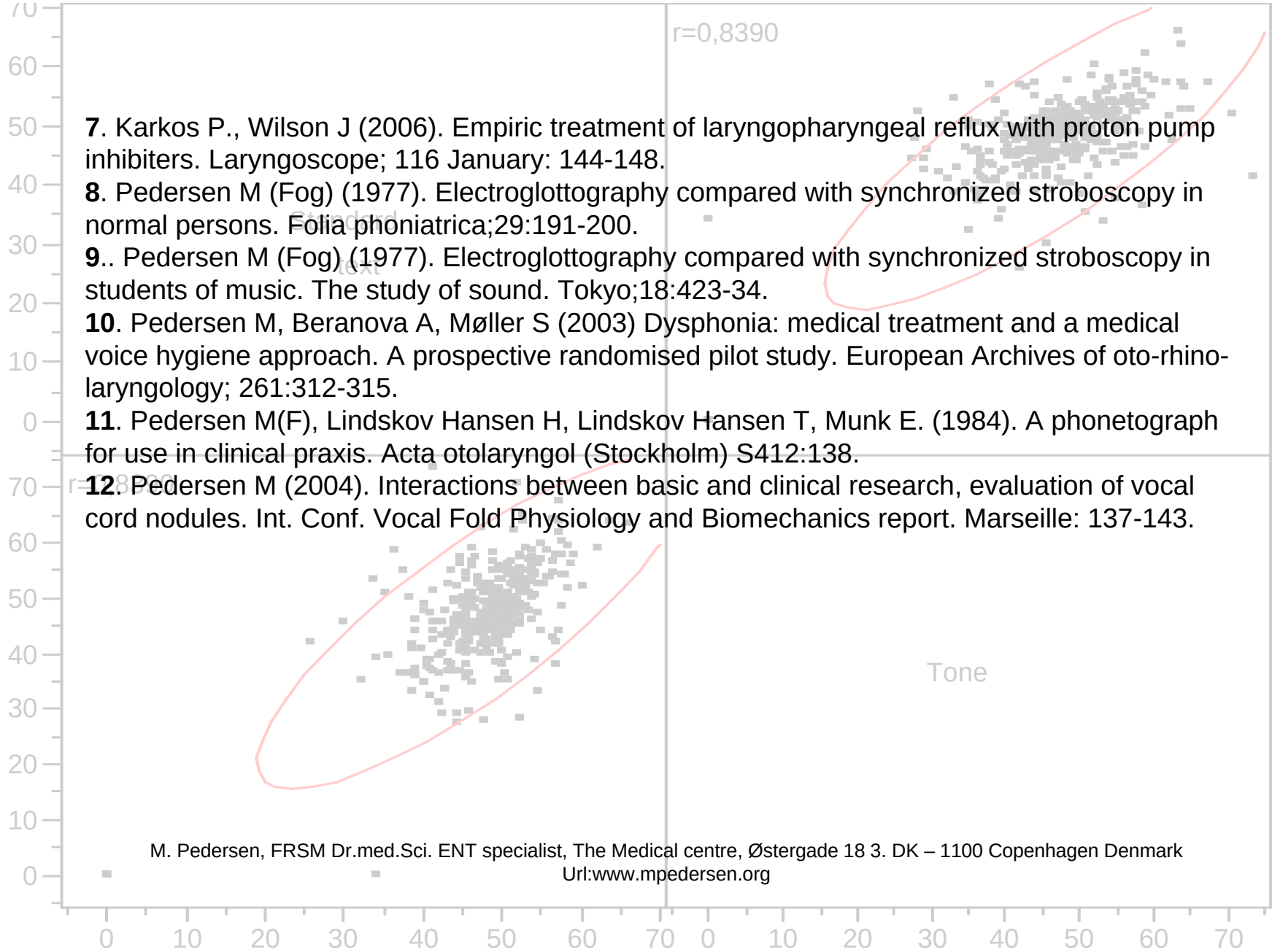
3. Pechère J, Kaplan E, ed. (2004). Streptococcal Pharyngitis, Optimal Management, Issues in Infectious Diseases. Karger Verlag.

4. Dikkers FG (1991). Intraobserver variation in diagnosis of benign non-neoplastic lesions of vocal folds. The Lancet. Letter; 337 (8745): 866.

5. Dettmar P, Sykes J, Little S, Bryan J (2006). Rapid onset of effect of sodium alginate on gastro-oesophageal reflux compared with ranitidine and omeprazole, and relationship between symptoms and reflux periods. Int J Clin Pract.; March, 60,3: 275-283.

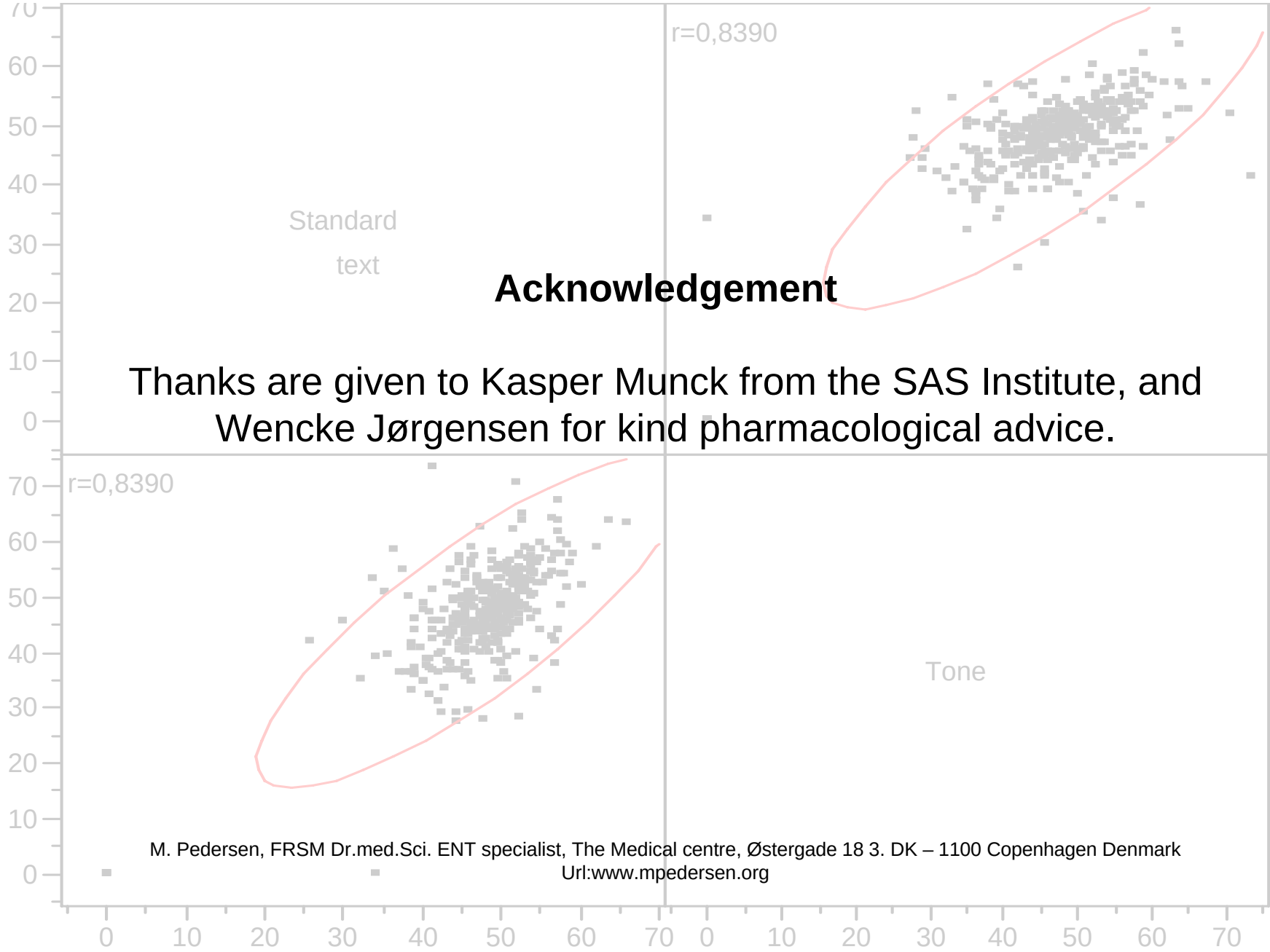
6. Pedersen M, McGlashan J, Bianco E, Beranova A, Gluud C (2003). Vocal fold nodules: a model for a prospective blinded randomized study with control group and statistical adequate follow-up. Union of European Phoniatricians. Toulouse. Abstract FP 07-5.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



7. Karkos P., Wilson J (2006). Empiric treatment of laryngopharyngeal reflux with proton pump inhibiters. Laryngoscope; 116 January: 144-148.
8. Pedersen M (Fog) (1977). Electroglottography compared with synchronized stroboscopy in normal persons. Folia phoniatrica;29:191-200.
9.. Pedersen M (Fog) (1977). Electroglottography compared with synchronized stroboscopy in students of music. The study of sound. Tokyo;18:423-34.
10. Pedersen M, Beranova A, Møller S (2003) Dysphonia: medical treatment and a medical voice hygiene approach. A prospective randomised pilot study. European Archives of oto-rhino-laryngology; 261:312-315.
11. Pedersen M(F), Lindskov Hansen H, Lindskov Hansen T, Munk E. (1984). A phonetograph for use in clinical praxis. Acta otolaryngol (Stockholm) S412:138.
12. Pedersen M (2004). Interactions between basic and clinical research, evaluation of vocal cord nodules. Int. Conf. Vocal Fold Physiology and Biomechanics report. Marseille: 137-143.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org



Acknowledgement

Thanks are given to Kasper Munck from the SAS Institute, and Wencke Jørgensen for kind pharmacological advice.

M. Pedersen, FRSM Dr.med.Sci. ENT specialist, The Medical centre, Østergade 18 3. DK – 1100 Copenhagen Denmark
Url:www.mpedersen.org