

Dysphagia research and clinical implementation

Liza Bergström

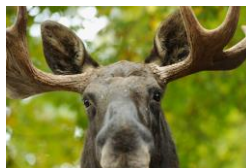
Legitimerad logoped | Sweden
 Certified Practising Speech Pathologist | Australia
 PhD Candidate | University of Queensland | Australia

Inspirationsforum .. och mig!

Liza Bergström

Legitimerad logoped | Sweden
 Guest Lecturer at Gothenburg University | Sweden

Certified Practising Speech Pathologist | Australia
 PhD Candidate | University of Queensland | Australia



Inspirationsforum.. att tänka på

1. Min forskning o varför jag började forska.
2. Hur kan jag inspirera mina kollegor till att börja forska?
3. Tänk på: nyttan för patienten/individ och användbarheten för professionen.

Inspirationsforum .. att tänka på

1. Varför började jag forska?

- International experience –working in different healthcare systems



- What is the evidence for what we do?
- How can we implement best practice

What is the evidence for what we do?

1. My research study investigated:
 - Evidence for assessing dysphagia with cervical auscultation?

Bergström L, Svensson P, & Hartelius L. (2014). Cervical Auscultation as an Adjunct to the Clinical Swallow Examination: A Comparison with Fiberoptic Endoscopic Evaluation of Swallowing. *International Journal of Speech-Language Pathology*, 16(5): 517-528.

Presented at the European Society of Swallowing Disorders (ESSD), Barcelona, Spain, 2012.

CERVICAL AUSCULTATION AS AN ADJUNCT TO THE CLINICAL SWALLOW EXAMINATION:

A comparison with Fiberoptic Endoscopic Evaluation of Swallowing (FEES)



LIZA BERGSTRÖM¹, PER SVENSSON², LENA HARTELIUS¹
¹University of Gothenburg, Gothenburg, Sweden
²Helsingborg Hospital, Helsingborg, Sweden

Cervical Auscultation (CA)



www.gu.se

Background to study

1. Dysphagia
 - 39-80% incidence in stroke patients Martino et al., 2005
2. Consequences
 - affect a persons nutrition, hydration, health
 - lead to malnutrition, pneumonia, increased hospital stay, increased costs, death Altman et al., 2011; Bours et al., 2009; Ekberg et al., 2002; Martino et al., 2009
3. Assessment methods
 - Klinisk 'bedside' sväljningsbedömning
 - Videoradiografi (VRG/Röntgen)
 - Fiberskopisk Undersökning av Sväljning (FUS)

www.gu.se

Assessment: Current practice

1. (Dysphagia screen)
2. Clinical Swallow Examination (CSE) Bours 2009, Rosenbek 2004, Rofes 2014.
3. Instrumental = gold standard (FUS / VRG)
4. Cervical auscultation (CA)
 - : one of several adjuncts to the CSE

www.gu.se

Clinical Swallow Examination (CSE)

- Evidence (Rosenbek et al, 2004)

Case history	sensitivity	specificity
• Patient / family report	38%	80%
• Pneumonia	32%	92%
• Poor nutrition	50%	76%
• Feeding tube	36%	95%
• Need for suctioning	5%	100%
• COPD	23%	82%
• Oromotor Assess		
• Tongue strength / ROM	50%	74%
• Lip strength / ROM	84%	76%
• Palatal movt	50%	71%
• Pharyngeal gag	91%	18%

www.gu.se

CSE – Evidence (cont.)

Oral trials	sensitivity	specificity
- Voicing post swallow	50%	84%
- DYSPHAGIA	25%	86%
- Laryngeal Palpation (delayed swallow)	48%	68%
• Overall dysphagia rating 91% <small>Rosenbek et al, 2004</small>		
- Combining clinical components = improve accuracy!		
• Not a new idea! <small>Lim et al, 2001; Rofes et al, 2014</small>		
• Rofes et al., 2014: CSE (Volume-Viscosity Swallow Test)		
• Lip movement + residue		
• Cough / voice changes	94%	81%
• Oxygen desaturation		

www.gu.se

Cervical Auscultation (CA)

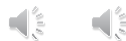
- Question: Does CA add to the clinical swallow examination?
- What is the evidence?
 - : Variable reports of validity and reliability Stroud et al, 2002; Leslie et al, 2007; Borr et al, 2007
- Influences for study = Controversial history
 - : Replace instrumental assessment (**NO!**)

www.gu.se

Study Aims

• Investigate the validity and reliability of CA – under 2 conditions

1. CA-only (using isolated swallow clips)
2. CSE + CA (reflect clinical practice)



• These 2 CA conditions were compared against FEES* reference test

*FEES = Fibreoptic Endoscopic Evaluation of Swallowing

Methods

1. 13 experienced dysphagia clinicians - trained in CA!
2. Rate 2 separate swallow samples (18 swallows each)
3. Answer set clinical questions
4. Answers compared against FEES reference test

Swallow samples

• All patients consecutively referred to Tues FEES clinic

- Comprehensive case history
- Oromotor assessment
- FEES assessment

• 2 x experienced FEES assessors analyse & answer 'set clinical questions'



Answer set clinical questions

1. Is the swallow dysphagic or normal?
2. Would you consider the patient to be safe on this consistency? Y/N
3. Dysphagia severity

2 Swallow Samples

CA-only	CSE+CA
5 x swallow recordings (sound clip) of (10 ml) thin fluids 1 x swallow repeated	5 x - case history (written information) - oromotor assessments (written, visual & audio-recording) swallow recordings of (10ml) thin liquids 1 x swallow repeated
5 x swallow recordings (sound clip) of (10 ml) nectar thick fluids 1 x swallow repeated	5 x - case history - oromotor assessments - swallow recordings of (10ml) of nectar-thick liquids 1 x swallow repeated
5 x swallow recordings (sound clip) of (10 ml) pudding consistency 1 x swallow repeated	5 x - case history - oromotor assessments - swallow recordings of (10ml) pudding consistency 1 x swallow repeated
18 total (15 swallow samples + 3 repeat)	18 total (15 swallow samples + 3 repeat)

Results

Q1. Dysphagic
Q2. Safe

- Sensitivity, specificity
- Statistical significance (p-value) calculated using logistic regression analysis (CA-only vs. CSE+CA)
- Intra-rater reliability was calculated using total percentage of absolute (perfect) agreement.

Q3. Dysphagia severity rating

- ICC for inter-rater reliability
- Spearmans correlation coefficient for each CA condition as correlated with FEES
- Intra-rater reliability

Sensitivity, specificity, reliability, correlation

	Dysphagia		Safe		Severity	
	Sensitivity (CI) - 95%	Specificity	Sensitivity	Specificity	ICC	Correlation with FEES
CA-only	88% (88.11 ± 5.31%)	50% (50.00 ± 13.09%)	87% (86.90 ± 7.22%)	89% (89.47 ± 7.97)	r = 0.68	rs = 0.64
CSE+CA	83% (83.98 ± 6.20%)	60% (59.62 ± 13.34%)	95% (94.94 ± 4.83)	92% (91.67 ± 6.99)	r = 0.74	rs = 0.75

Findings

- Q1 Dysphagia
- Q2 Safe
- Q3 Severity
- CSE+CA mostly better than CA-only
- Not always statistically sig different
- CSE+CA better rater reliability*
- CSE+CA greater correlation w FEES* (rs= 0.75)

*Correlation with FEES = substancial agreement (statistically).

Clinical application

- CA has similar and often better validity as compared with current CSE components.

	Sensitivity	Specificity
CSE components	5 - 91%	18 - 100%
CA as an adjunct	83 - 95%	60 - 92%

- CA compared with instrumental rater reliability

	INTRA-RATER	INTER-RATER
FEES	r = 0.72 - 0.73	r = 0.51 - 0.64
VFSS	r = 0.74 - 0.79	r = 0.56 - 0.67
CA	r = 0.74	95 %

Kelly et al, 2006 & 2007

Conclusion

- The more clinical information the more accurate results (sensitivity, specificity and correlation w FEES)
- CA has similar and often better validity and reliability as compared with current CSE components.
- Comparable rater reliability to FEES and VFSS.
- Yes! CA is a valuable adjunct to the clinical swallow examination.

Inspirationsforum ..

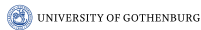
- Varför började jag forska? (My research)

2. Hur kan jag inspirera mina kollegor till att börja forska?

Hur kan jag inspirera mina kollegor till att börja forska?

"Tänk på: nyttan för patienten/individnen och användbarheten för professionen"

1. Clinical question?
2. Research supports?



For example..

Logoped (Per Hjerstrand) from Halmstadsjukhus, Halland

- Undersöker sväljscreening "Hostreflexetest"
- Kan detta användas för att identifiera personer med tyst aspiration?
- Sökte forsknings pengar (från Region Hallands FoU, Parkinsonfonden)
- Lyckades
- Reste till Nya Zeeland (Professor Huckabee)
- University of Canterbury Swallowing Rehabilitation Research Lab

Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se

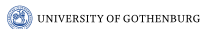


Inspirational ideas!

What's happening in dysphagia (or your world of interest)?

- International Dysphagia Diet Standardisation Initiative
<http://iddsi.org/>
- Efficacy of MDTP (McNiell Dysphagia Therapy Program)
(Research other dysphagia rehabilitation?)
- **Use of therapy assistants (rehab intensity)**
- **7 day week therapy for stroke patients**

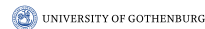
Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se



Inspirational ideas – cont.

- Swallow-IT (computer-app used for swallowing therapy)
- **Follow-up post hospital discharge (are patients forgotten?)**
(ESSD) European Society of Swallowing Disorders

Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se

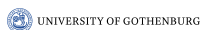


More inspirational ideas - where?

- What is relevant for your workplace?
- What resources / evidence could you implement in your practice?
- **Ideas from where?**
- Link in with other Swedish / European / International organisations – get ideas / what's happening in the world?
- Library to send relevant Journal (Table of Contents)
- Journal Club

• Masters

Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se



Support -Gothenburg University

- Masters
- Fristående kurser
- [Fördjupat självständigt vetenskapligt arbete inom logopedi, 30 högskolepoäng](#)
- [Evidensbaserad logopedi, 15 hp](#)

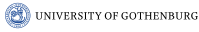
Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se



Inspiration?

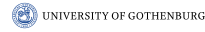
- You have it all here!
- Gothenburg University – at your doorstep
- Funding – apply!
- Sweden – leading research

Division of Speech and Language Pathology,
Institute of Neuroscience and Physiology,
Sahlgrenska Academy at University of Gothenburg
www.gu.se



Questions?

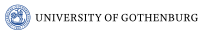
www.gu.se



References

- Altman, K., Yu, G-P., Schaefer, D (2011). *Consequences of dysphagia in the hospitalised patient: Impact on prognosis and hospital resources.* Archives of Otolaryngology, Head and Neck Surgery, 26(2):112-134
- Borr C, Hielscher-Fastabend M, & Lucking A. (2007) Reliability and validity of cervical auscultation: a controlled comparison using videofluoroscopy. *Dysphagia* 22: 225-234
- Bours, G.J., et al., *Bedside screening tests vs. videofluoroscopy or fibreoptic endoscopic evaluation of swallowing to detect dysphagia in patients with neurological disorders: systematic review.* J Adv Nurs, 2009. 65(3): p. 477-93.
- Ekberg O, Hamdy S, Woisard V, Wuttge-Hannig A, Ortega P. Social and Psychological Burden of Dysphagia: Its Impact on Diagnosis and Treatment. *Dysphagia* 2002; 17:139-146.
- Kelly, A. M., Leslie, P., Beale, T., Payten, & Drinnan, M. J. (2006). Fiberoptic endoscopic evaluation of swallowing and videofluoroscopy: does examination type influence perception of pharyngeal residue severity? *Clinical Otolaryngology*, 31, 425-432.
- Kelly, A. M., Drinnan, M. J., & Leslie, P. (2007). Assessing Penetration and Aspiration: How Do Videofluoroscopy and Fiberoptic Endoscopic Evaluation of Swallowing Compare? *The Laryngoscope*, 117, 1723-1727.
- Leslie, P., Drinnan, M. J., Zammit-Maempel, I., Coyle, J. L., Ford, G. A., & Wilson, J. A. (2007). Cervical Auscultation Synchronised with Images from Endoscopy Swallow Evaluations. *Dysphagia* 22, 290-298.

www.gu.se



References

- Lim HB, Lieu PK, Phua SY, Seshadri R, Venketasubramanian N, Lee SH, Choo WJ. (2001) Accuracy of bedside clinical methods compared with fiberoptic endoscopic examination of swallowing (FEES) in determining the risk of aspiration in acute stroke patients. *Dysphagia*, 16:1-6.
- Martino, R., Foley, N., Bhogal, S., Diamant, N., Speechley, M., & Teasell, R. (2005) Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. *Stroke*, 36(12), 2756-2763. doi:10.1161/01.STR.0000190056.76543.eb
- Martino, R., D. Beaton, and N.E. Diamant. *Using different perspectives to generate items for a new scale measuring medical outcomes of dysphagia (MOD).* Journal of clinical epidemiology, 2009. 62(5): p. 518-526.
- Rofes, L., Arceola, V., Mukherjee, R., & Clavé, P. (2014). Sensitivity and specificity of the Eating Assessment Tool and the Volume-Viscosity Swallow Test for clinical evaluation of oropharyngeal dysphagia. *Neurogastroenterology & Motility*, 26(9), 1256-1265. doi:10.1111/nmo.12382
- Rosenbek, J. C., McCullough, G. H., & Wertz, R. T. (2004). Is the information about a test important? Applying the methods of evidence-based medicine to the clinical examination of swallowing. *J Commun Disord*, 37(5), 437-450. doi:10.1016/j.jcomdis.2004.04.007
- Stroud A, Lawrie B & Wiles C. (2002) Inter- and intra-rater reliability of cervical auscultation to detect aspiration in patients with dysphagia. *Dysphagia* 16: 640-645
- Walto, A., Bailey, G. L., Molfenter, S. M., Zoratto, D. C., & Steele, C. M. (2011). Voice-quality abnormalities as a sign of dysphagia: validation against acoustic and videofluoroscopic data. *Dysphagia*, 26(2), 125-134. doi:10.1007/s00455-010-9282-4

www.gu.se