

VALIDATION OF INHALATION TECHNIQUE VIDEOTAPED IN ASTHMATIC CHILDREN UNDER 5 YEARS

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Background

1. Asthma and virus's induced wheezing are among the most common diseases in childhood
2. The response to treatment depends especially on the correct use of the inhalation device to deliver the medication
3. Correct delivery of inhaled medications is difficult for the majority of caregivers and patients.

Clinical inhalation situations recorded by video in conjunction with the use of a point-to-point checklist of correct inhalation technique could help to train caregivers and patients.



Purpose

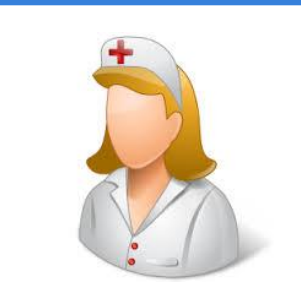
The aim of the study was to test the reliability and validity of video recorded inhalation technique in the clinical setting using a 10 steps – checklist.

Method

3 experts in pediatric pulmonology



Respiratory consultant



Clinical nurse



Clinical pharmacist

and one



New observer (NO)

scored 40 video recorded inhalation demonstrations using pressurized metered dose inhaler (pMDI) with spacer using a 10 steps-checklist to assess interobserver reliability.

Intraobserver reliability was assessed for each observer after 1 month by scoring the inhalation demonstrations a second time.

Both inter- and intraobserver reliability were expressed by mean Kappa (K) scores.

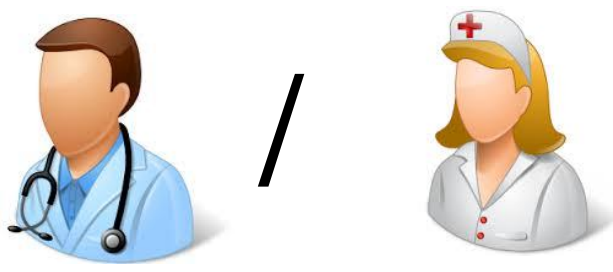
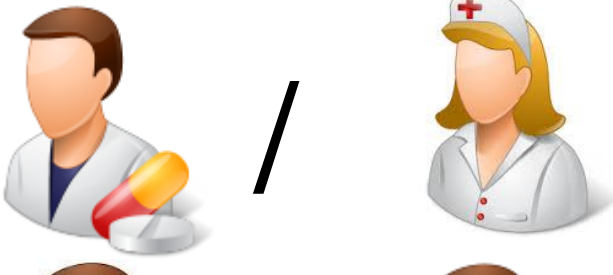
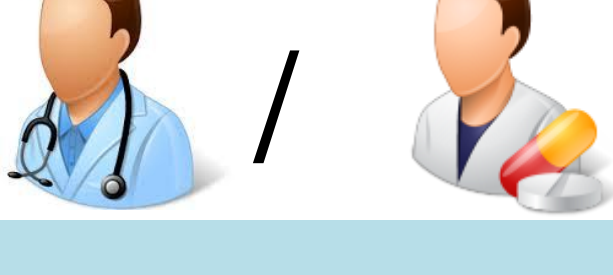



K is defined as follows: $K = \frac{Po - Pe}{1 - Pe}$ with Po: percent (%) observed agreement and Pe = percent (%) expected agreement. A kappa of 1 indicates perfect agreement, whereas a kappa of 0 indicates agreement equivalent to chance.

Checklist

- 1) Remove the cap
- 2) Shake the inhaler
- 3) Assemble pMDI and spacer correctly
- 4) Position of the patient (sitted with pMDI upright)
- 5) Mask fitted well on the child's face
- 6) One activation after the mask is fitted
- 7) Five breaths
- 8) Quiet breathing
- 9) Shake the inhaler before another push
- 10) Activate inhaler once

Results

Reliability between the experts



Reliability INTER-observer	Po	Pe	Weighted Kappa	IC _{95%}
	97.8	82.0	0.88	0.68 – 1.00
	97.8	82.0	0.88	0.68 – 1.00
	98.3	83.0	0.90	0.71 – 1.00
Reliability INTRA-observer	Po	Pe	Weighted Kappa	IC _{95%}
	98.6	82.2	0.9	0.72 – 1.00
	100	81.2	1.0	0.81 – 1.00
	100	82.3	1.0	0.81 – 1.00

The 3 experts didn't agree on 9 videos (quality of breathing (n=7), position of the patient (n=1), mask's position on the child's face (n=1)).

After discussion about these 9 videos, an **expert's consensus** was established for each videorecording and constitutes the **Gold standard** (GS) of our method.

The next step was to evaluate if a NO can be easily validated for the evaluation of the inhalation technique. She watched independently the same videos in the same way to compare the obtained results.

Reliability between GS and NO

Reliability INTER-observer	Po	Pe	Weighted Kappa	IC _{95%}
	98.6	81.3	0.93	0.81 – 1.00
Reliability INTRA-observer	Po	Pe	Weighted Kappa	IC _{95%}
	99.4	81.1	0.97	0.77 – 1.00

Discussion - Conclusion

Objective assessment of inhalation technique is important for measuring the effect of educational intervention and the videotaped recording with our checklist proved to be a reliable tool for this research purpose.

This tool can be also used for training purpose when pediatricians and nurses need to be trained. By doing this, the inhalation technique and the correct inhaler use can be enhanced among caregivers and patients.