



Tolerability data for induced sputum sampling in children with Cystic Fibrosis

The Cystic Fibrosis Sputum Induction Trial (CF-SpIT)

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Introduction

- The Cystic Fibrosis Sputum Induction Trial (CF-SpIT) is a prospective internally-controlled comparative study of cough swab, induced sputum, and bronchoscopic lavage in children with cystic fibrosis, to assess microbiological yield using both standard culture techniques and sequence-based culture-independent approaches to microbiology.
- Presented here are tolerability data for the induced sputum procedure in the first 40 children recruited to the study.

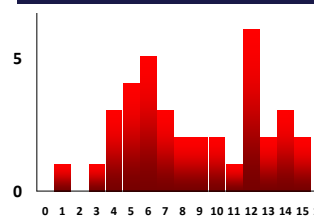
Methods

- Children aged 6 months to 18 years were recruited at annual review or on hospital admission with a chest exacerbation.
- The induced sputum protocol is standardised, quick and universally applicable. It was performed in all cases by a highly specialist paediatric respiratory physiotherapist.
- Objective measures including heart rate and respiratory rate were recorded pre- and post-procedure. Spirometry was recorded pre- and post-procedure in children age > 7 years.
- Questionnaires were completed by physiotherapist and parent to subjectively assess discomfort from the procedure.

Induced Sputum Protocol

- Induced sputum sampling is performed by a specialist paediatric physiotherapist**
- Where possible induced sputum should be performed after a 2 hour fast.**
- Make an initial assessment of the chest.**
- Attach an oxygen saturation monitor and document oxygen saturations, heart rate, respiratory rate.**
- Perform lung function in children >7 years old.**
- Before the procedure, obtain a cough swab.**
- Administer 200mcg salbutamol via metered dose inhaler and spacer to prevent bronchospasm.**
- Use a jet nebuliser attached to wall oxygen at a flow rate of 8 l/min to deliver 8 ml of 7% hypertonic saline for 15 minutes.**
- Make an assessment of the chest every 5 minutes.**
- Apply physiotherapy techniques during and after procedure, including chest percussion, vibration, active cycle of breathing techniques, PEP and assisted autogenic drainage.**
- Obtain sputum either by expectoration (in children able to cooperate) or by suctioning through the oropharynx using a sterile, mucus extractor or suction catheter size 10.**
- Make a final assessment and document observations, oxygen saturations, and lung function in children >7 years old.**
- Repeat cough swab after procedure.**

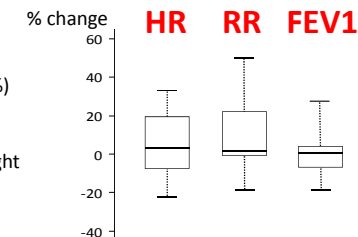
Results



- 38 patients underwent the induced sputum procedure
- 14 of these patients were aged 6 years or less (36%)
- Only 8 patients were spontaneously productive before the procedure (21%)
- Secretions were obtained in 25/38 patients (65%).
- Oropharyngeal suction was required in 12 patients (31%)

OBJECTIVE tolerability

- Transient side effects were seen in only 3 patients (8%).
- The procedure was not tolerated in only one patient because of vomiting (3%)
- Change in heart rate, respiratory rate and FEV1 (in children >7years) showed notable transient change in a minority of patients, and these were not thought to be clinically important responses



SUBJECTIVE tolerability

- Physiotherapist & parent were given a Likert scale to rate tolerability of the procedure, on a scale of 1-10. (score 10 = best)
- Paired scores for each patient showed a high correlation (R=0.97)
- Mean parental score: 8.6 ; Mean physiotherapist score: 9.40
- 37/38 patients and families were willing to have regular induced sputum sampling in the future, even if secretions had not been successfully obtained on this occasion.

Young children aged <6 years

- No patients age < 6years, were spontaneously productive prior to the procedure
- Secretions were successfully obtained in 9 out of 14 patients (65%)
- Oropharyngeal suction was required in 8 out of 14 (57%) - more frequently than in older children

Conclusions

- Induced sputum sampling is well tolerated in children of all ages including preschool children.
- Success in obtaining secretions, subjective assessment of discomfort, and objective measures of tolerability did not differ between younger and older children.
- Regular induced sputum sampling is acceptable to families as part of routine care.

