SHORT REPORT

Rapid painless diagnosis of viral respiratory infection

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Arch Dis Child 2002;**86**:372–373

The concordance of nasal compared with nasopharyngeal swabs was assessed for the diagnosis of respiratory viral infections, and the degree of discomfort associated with each procedure was compared. The use of nasal swabs was shown to be as accurate but significantly less painful than nasopharyngeal swabs for virus diagnosis.

Acute respiratory infection (ARI) is the commonest cause of illness in children.[1] With the development of rapid viral diagnostic technologies and the availability of effective antiviral therapy, community physicians will be able to make more accurate treatment decisions and reduce unnecessary antibiotic usage. The procedure commonly used for specimen collection in the diagnosis of viral ARI is a painful and unpleasant nasopharyngeal swab or aspirate, and a relatively painless alternative would certainly be desirable.

In a recent study, investigators showed that nasal swabs are as effective as nasopharyngeal aspirates for the rapid diagnosis of influenza in children.[2] However, no previous study to date has examined the pain and discomfort associated with obtaining such specimens.

PARTICIPANTS, METHODS, AND RESULTS

The study was conducted between November 1999 and March 2000 in a paediatric community based office practice and at the Hospital for Sick Children, Toronto, Canada. Paired lower nasal swabs (LNS) and high nasopharyngeal swabs (NPS) were obtained from each of 199 children with a median age of 1.5 years (range 11 days to 13.8 years), presenting with acute ARI. For LNS a cotton tipped swab was placed 1.0–1.5 cm into the nostril and rotated three or four times. For NPS, the swab was inserted 5.0–6.0 cm in the opposite nostril and the rotation procedure repeated. Swabs were submitted in transport medium for rapid diagnosis of influenza and respiratory syncytial virus (RSV) by direct immunofluorescence microscopy (DFA)[3] using monoclonal antibodies (Light Diagnostics, Temecula, California), and by an influenza specific enzyme immunoassay (EIA; Directigen, Becton, Dickinson & Co.).[3] Discomfort with each procedure was assessed in a subset of children. For those less than 3 years of age, cry duration was measured. In older children, a standard Oucher pain scale[4] (score 0–100) and a validated Child Facial Coding System[5] (score 1–100), using videotape recordings of 13 facial expressions was measured by a trained coder unaware of the study design. The study was approved by the Hospital for Sick Children Research Ethics Board and informed consent was obtained.

Table 1 Virus identification by direct immunofluorescence microscopy, lower nasal swab versus nasopharyngeal swab

Lower nasal swab	Nasopharyngeal swab			
	Influenza	RSV	Neither	Total
Influenza	49	0	5	54
RSV	0	35	4	39
Neither	8	4	94	106
Total	57	39	103	199

Table 2 Pain scores, lower nasal swab versus nasopharyngeal swab

		Lower nasal swab		Nasopharyngeal swab		
Pain variable	n	Median	Range	Median	Range	p value
Cry duration, seconds	25	5	0–55	20	0–120	<0.01
Oucher score	12	13	0–80	15	0–100	<0.01
Child facial coding system	14	10	0–50	38.5	0–85	<0.01

Of the 308 swabs analysed, influenza virus was detected in 27% (54 of 199) of LNS and 29% (57 of 199) of NPS using DFA (table 1). Influenza virus was detected in 26% (52 of 199) of LNS and 28% (55 of 199) of NPS using EIA. For RSV, the detection from LNS and NPS was identical at 20% (39 of 199) using DFA (table 1).

The sensitivity of LNS compared with NPS for influenza virus detection using DFA and EIA was 86% (95% CI: 81% to 91%) and 87% (95% CI: 83% to 92%) respectively, with identical specificities of 97% (95% CI: 95% to 99%). Positive predictive values were 91% (95% CI: 87% to 95%) and 92% (95% CI: 88% to 96%) using DFA and EIA respectively, and negative predictive values were identical at 95% (95% CI: 92% to 98%). The detection of RSV was comparable to that of influenza virus (table 1). Significantly less pain was experienced with LNS compared with NPS on all three outcomes measured. In two of the assessments, the measured pain was fourfold lower with LNS (table 2).

COMMENT

In this study nasal swabs were shown to be as effective as nasopharyngeal swabs in identifying respiratory viruses (influenza, RSV), consistent with a recent report showing a similar result for influenza when compared with nasopharyngeal aspirates.[2] Nasal swabs were also shown to be significantly less painful. Although the measurement of pain in this study was limited by the small sample size of convenience, the results were nevertheless both clinically and statistically significant. We conclude that nasal swabs should be considered the procedure of choice for the detection of respiratory viruses in children presenting with ARI.

Abbreviations: ARI, acute respiratory infection; DFA, direct immunofluorescence microscopy; EIA, enzyme immunoassay; LNS, lower nasal swab; NPS, high nasopharyngeal swab; RSV, respiratory syncytial virus

ACKNOWLEDGEMENTS

We thank S. Stewart for data collection and N. Lear for data entry. This work was supported by a grant from Becton, Dickinson and Company.

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Accepted 10 January 2002

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ARCHIVIST

Tailoring treatment for retinoblastoma

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Primary chemotherapy is more effective in retinoblastoma tumours in the macula and if children are over 2 months old, according to a study by at the Ocular Oncology Service at St Bartholomew's and Moorfields Hospitals, London, UK.

Noting that primary chemotherapy produced varying outcomes in their patients, Gombos *et al* examined individual tumour features—basal size and location, previously rather overlooked—and patient age at diagnosis to see whether they predicted outcome. Their retrospective review was confined to 36 children receiving chemotherapy alone and followed up for one year minimum (range 12–44 months). Half were boys, 10 had familial retinoblastoma, and eight sporadic retinoblastoma. Within 42 eyes were 78 tumour foci: 31 (40%) in the macula, 38 (50%) in the equatorial region, and eight (10%) in the anterior ora region; 56 (72%) responded to chemotherapy alone; 22 (28%) needed other treatment.

Chemotherapy was most successful for macular tumours, tumours >2 mm across, sporadic tumours, and for children over 2 years at diagnosis, logistic regression showed. This was true for macular tumours when age—a confounder linked with tumour size and inheritance—was accounted for. Further analysis confirmed age >2 months and macular site as independently linked to favourable treatment outcome, but the relation with tumour size was less clear.

These insights allow treatment to be better tailored at diagnosis. Macular foci probably do not need adjuvant thermotherapy; tumours <2 mm across demand careful regular checks. In view of the small numbers, poor outcome in very young children deserves further study.

▲ *British Journal of Ophthalmology* 2002;**86**:80–83.