Comparative study of nasopharyngeal aspirate and nasal swab specimens for detection of influenza

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The neuraminidase inhibitors zanamivir and oseltamivir have been shown to be effective in the treatment of influenza A and B viral infections. Both of these drugs are ineffective against respiratory infections caused by other microbes. Although the onset of influenza is often abrupt with prominent systemic features, the clinical spectrum of this disease is extremely broad and it cannot be reliably distinguished from other respiratory infections on clinical grounds alone.[1] To help them decide which patients will benefit from the new treatments for influenza doctors therefore need rapid and sensitive point of care tests to verify the cause of the infection.

A nasopharyngeal aspirate is generally considered the best specimen for detection of influenza viruses,[2] but there are few comparative studies of the effect of sample type on detection of influenza.[3 4] Collection of a nasopharyngeal aspirate is unpleasant for the patient and requires a suction device, making it unfeasible in many clinical situations. We conducted a prospective study comparing the detection rates of influenza in nasal swabs and nasopharyngeal aspirates obtained at the same time.

Participants, methods, and results

The study was carried out during the influenza epidemic of 1998-9 at the department of paediatrics, Turku University Hospital, Finland. A total of 101 children admitted to hospital with an upper respiratory tract infection were enrolled. The median age of the children was 13 months (range 2 weeks to 15 years); 53 of them were girls. The study protocol was approved by the ethics committee of Turku University Hospital, and oral informed consent was obtained from the parents of the children.

A nasal swab was obtained from one nostril with a sterile cotton swab, which was then placed in a dry sterile vial. The nasopharyngeal aspirate was obtained with a disposable catheter (Pennine Healthcare, Derby) connected to a mucus extractor (Maersk Medical, Denmark). The catheter was inserted into the opposite nostril to a depth of 5-7 cm and drawn back while applying gentle suction with an electric suction device. Both specimens were obtained without instillation of any solution into the nostrils. The specimens were transported to the laboratory at room temperature and tested for influenza A and B antigens by time resolved fluoroimmunoassay as described earlier.[5]

Of the 101 children enrolled, 23 had influenza viruses detected in the nasopharyngeal aspirate specimens (table). The nasal swab specimens showed influenza in 21 of these 23 children, giving a sensitivity of 91% (95% confidence interval 73% to 98%) compared with the aspirate specimens. No child had influenza detected in only the nasal swab (specificity 100%; 86% to 100%).

Detection of influenza viruses in nasopharyngeal aspirate and nasal swab specimens

	Aspirate			
Swab	Influenza A	Influenza B	Neither	Total
Influenza A	19	0	0	19
Influenza B	0	2	0	2
Neither	2	0	78	80
Total	21	2	78	101

Comment

Testing of nasal swabs detected influenza in 21 of the 23 children who were found to have the virus in nasopharyngeal aspirate specimens. Nasal swab specimens are easy and painless to collect and require no additional devices. When used with point of care antigen detection tests,[4] nasal swab specimens could therefore help optimise the use of anti-influenza drugs in everyday clinical practice. Further studies are needed to determine the usefulness of this approach in adults and with different viral diagnostic methods.

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Endpiece

Examinations

Examinations are formidable even to the best prepared, for the greatest fool may ask more than the wisest man can answer.

Charles Colton (1780?-1832), *Lacon*

Submitted by John Haworth, retired general practitioner, Carlisle