

CHEST[®]

Official publication of the American College of Chest Physicians



Cyclophosphamide induces false-positive results in detection of aspergillus antigen in urine

K Hashiguchi, Y Niki and R Soejima

Chest 1994;105:975-976

The online version of this article, along with updated information and services can be found online on the World Wide Web at:

<http://chestjournal.org>

CHEST is the official journal of the American College of Chest Physicians. It has been published monthly since 1935. Copyright 2007 by the American College of Chest Physicians, 3300 Dundee Road, Northbrook IL 60062. All rights reserved. No part of this article or PDF may be reproduced or distributed without the prior written permission of the copyright holder (<http://www.chestjournal.org/misc/reprints.shtml>). ISSN: 0012-3692.

A M E R I C A N C O L L E G E O F



C H E S T

P H Y S I C I A N S[®]

The opinions and assertions contained herein are the private ones of the authors and are not to be construed as official or as reflecting the views of the US Department of Defense.

REFERENCES

- 1 Light RW, MacGregor I, Luchsinger PC, Ball WC. Pleural effusion: the diagnostic separation of transudates and exudates. *Ann Intern Med* 1972; 77:507-13
- 2 Rector WG, Reynolds TB. Superiority of the serum-ascites albumin difference over the ascites total protein concentration in separation of transudative and exudative ascites. *Am J Med* 1984; 77:83-5
- 3 Pare P, Talbot J, Hoefs JC. Serum-ascites albumin concentration gradient: a physiologic approach to the differential diagnosis of ascites. *Gastroenterology* 1983; 85:240-4
- 4 Runyon BA, Montano AA, Akrviadis EA, Antillon MR, Irving MA, McHutchison JG. The serum-ascites albumin gradient is superior to the exudate-transudate concept in the differential diagnosis of ascites. *Ann Intern Med* 1992; 117:215-20

Oximeter Malfunction

To the Editor:

We wish to report a pattern of oximeter malfunction to your readers, as many may have experienced similar problems. The University of New Mexico Hospital recently acquired the Marquette Tramscope with Tram 200n (Marquette Electronics, Milwaukee), which uses the Ohmeda disposable EasyProbe (Ohmeda Monitoring Systems, Louisville, Colo) for oxygen saturation monitoring. We noticed that this new system often gave the alarm signal "Probe off patient." Approximately 150 additional probes were used on patients over a 2-week period because of the belief that these were malfunctioning, since they appeared to be correctly applied. Each probe costs \$21.31, resulting in an excess expenditure of approximately \$3,200.

Further investigation revealed that this false error was only occurring in south-facing rooms and was caused by failure to exclude extraneous incident sunlight. Using the Lutron LX-101 luxmeter (Cole-Palmer Instrument, Niles, Ill), we documented that sunlight falling on the probe with an intensity of more than 985 lux caused significant signal deterioration and that above 1,110 lux the error signal "Probe off patient" was generated. For incandescent light, the required intensity was 2,000 lux. We were unable to generate an error signal with fluorescent light because of its lower intensity (only 1,320 lux was achieved with all lights on in patient rooms). Shielding the sensor with aluminum foil abolished all false alarm signals.

It is fortunate that the Ohmeda oximeter system generates an alarm condition of "Probe off patient" as the addition of extraneous light is usually sensed as the wavelengths of both oxyhemoglobin and deoxyhemoglobin, resulting in a ratio of 1:1, which is interpreted as a saturation of 85 percent.¹ This saturation will not vary with changes in actual patient oxygen saturation. The EasyProbe has a light-emitting diode intensity of 43 mA. Ohmeda has created the OxyTip sensor, which uses 121 mA and minimizes this problem. This new device includes a foil backing and completely excludes incandescent light. Sunlight is excluded until it exceeds 4,000 lux. The new OxyTip probe is now available at a lower cost than the EasyProbe and is therefore our preferred device.

We suggest that when unvarying saturations of 87 percent are recorded or the "Probe off patient" signal is generated, extraneous light should be measured and excluded before changing probes. This will increase patient safety and result in lower patient charges.

Howard Levy, M.D.,

REFERENCE

- 1 Schnapp LM, Cohen NH. Pulse oximetry: uses and abuses. *Chest* 1990; 98:1244-50

Cyclophosphamide Induces False-Positive Results in Detection of Aspergillus Antigen in Urine

To the Editor:

Pulmonary aspergillosis, especially invasive pulmonary aspergillosis (IPA) is a common life-threatening complication among immunocompromised patients.¹ Early diagnosis and intensive antifungal chemotherapy with amphotericin B is the only way to save such patients who contract this disease.

The detection of circulating *Aspergillus* galactomannan antigen is one promising method for early diagnosis of IPA.^{2,3} Recently, a kit for *Aspergillus* antigen detection (Pastorex *Aspergillus*, Diagnostics Pasteur, Marnes-la-Coquette, France) has become commercially available.⁴ Some retrospective studies indicated that the positive rates of the kit were not high enough,⁵ but other prospective studies have shown satisfactory results for the detection of antigen in not only the serum but also the urine of patients.

We have been using the kit to detect *Aspergillus* antigen in the serum and urine of rats with IPA. We have already reported on our animal models of IPA.⁶ In our recurrent IPA model, corticosteroid or cyclophosphamide was administered to rats with chronic stable aspergillus lesions in their lungs to induce aggravation of the infection.

When the steroid was administered, it took a relatively long time (4 to 7 weeks) to detect antigen in their serum and urine. However, when reinduction therapy with cyclophosphamide was begun the next day, the urine, but not the serum, of all the animals was antigen positive. We continued the experiment and found that almost all urine samples showed positive results until 18 days after the start of 3 days of cyclophosphamide treatment. We could not believe these results, so we injected cyclophosphamide into noninfectious rats. We found that the urine of all rats was antigen positive.

Although Pastorex *Aspergillus* is considered to be a useful kit for the early diagnosis of IPA, the possibility of false-negative results should be considered when the kit is used to detect antigen in the urine of patients treated with cyclophosphamide.

Kohji Hashiguchi, M.D.,
Yoshihito Niki, M.D., F.C.C.P., and
Rinzo Soejima, M.D., F.C.C.P.,
Kawasaki Medical School,
Okayama, Japan

Reprint requests: Dr. Hashiguchi, 577 Matsushima Kurashiki,
Okayama 701-01 Japan

REFERENCES

- 1 Spearing RL, Pamphilon DH, Prentice AG. Pulmonary aspergillosis in immunosuppressed patients with haematological malignancies. *QJM* 1986; 59:611-25
- 2 Yu B, Niki Y, Armstrong D. Use of immunoblotting to detect *Aspergillus fumigatus* antigen in sera and urines of rats with experimental invasive aspergillosis. *J Clin Microbiol* 1990; 28:1575-79

- 3 Burnie JP. Antigen detection in invasive aspergillosis. *J Immunol Methods* 1991; 143:187-95
- 4 Van Cutsem J, Meulemans L, Van Gerven F, Stynen D. Detection of circulating galactomannan by Pastorex *Aspergillus* in experimental invasive aspergillosis. *Mycoses* 1990; 33:61-9
- 5 Hashiguchi K, Wada H, Yamada O, Yawata Y, Yoshida K, Okimoto N, et al. A case of chronic myelogenous leukemia with pulmonary aspergillosis diagnosed by the detection of circulating *Aspergillus* antigen. *Assoc Infect Dis* 1992; 66:1592-96
- 6 Niki Y, Bernard EM, Edwards FF, Schmitt HJ, Yu B, Armstrong D. Model of recurrent pulmonary aspergillosis in rats. *J Clin Microbiol* 1991; 29:1317-22

Quantitative Study of the Bronchial Bacterial Flora in Acute Exacerbations of Chronic Bronchitis

To the Editor:

Exacerbations of chronic bronchitis are commonly characterized by increases in dyspnea, cough, and purulent sputum production. The role of bacterial infection in this disease is unclear because of the heterogeneity of the patients studied and the inaccuracy of routine expectorated sputum cultures in characterizing the tracheobronchial microflora in these patients.^{1,3} We recently conducted a prospective study of quantitative culture of the distal bronchial microflora in acute exacerbations of chronic bronchitis.

In 20 patients who required hospital admission because of an acute exacerbation of chronic bronchitis, written consent was obtained to perform fiberoptic bronchoscopy and culture of bronchial secretions obtained with a protected brush catheter. None of the patients had received antimicrobial therapy in the preceding 15 days, and their chest roentgenograms did not show alveolar infiltrates. The brush specimens were placed on agar plates for aerobic culture and were incubated for 48 h in a 5 percent CO₂ atmosphere.

The results of quantitative cultures of the protected brush specimens are shown in Table 1. In 18 of the 20 samples (90 percent) some organisms were isolated, and in 15 (75 percent) the concentration was equal to or greater than 10³ colony-forming units (CFU) per specimen. In 14 of the 20 samples (70 percent), *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Moraxella catarrhalis* organisms were isolated. In 10 cases (55 percent of the positive specimens), more than one organism grew (2.2 ± 1.3 organisms per sample). *Haemophilus influenzae*

Table 1 — Frequency and Count of Organisms Recovered From Protected-Brush Specimens*

Organism	Concentration, CFU				
	Total	10 ⁵	10 ⁴	10 ³	10 ²
<i>Streptococcus pneumoniae</i>	9	4	3	1	1
<i>Haemophilus influenzae</i>	5	3	1	1	0
<i>Moraxella catarrhalis</i>	3	0	3	0	0
<i>Pseudomonas aeruginosa</i>	1	0	0	1	0
<i>Neisseria Meningitidis</i>	1	1	0	0	0
Others†	22	0	3	16	3

*Values are numbers of bacterial strains isolated in the 20 specimens obtained. CFU = colony-forming units.

†*Streptococcus viridans*, 12 specimens; *Neisseria* sp., 5; diphtheroids, 2; coagulase-negative Staphylococcus organisms, 1; *Streptococcus agalactiae*, 1; *Pasteurella multocida*, 1.

and *M catarrhalis* organisms were always isolated as part of a mixed flora, while 5 of 9 strains of *S pneumoniae* were obtained in pure culture (0 vs 55 percent; p = 0.04, Fisher test). The common respiratory pathogens (*S pneumoniae*, *H influenzae*, and *M catarrhalis*) grew in concentrations equal to or greater than 10⁴ CFU per specimen more frequently than the other microorganisms (77 vs 13 percent; p < 0.001, χ^2 test).

In our experience, bronchial secretions from the majority of patients with an acute exacerbation of chronic bronchitis show bacterial densities equal to or greater than 1 million organisms per milliliter (> 10⁶ CFU per specimen).⁴ We have also observed that *S pneumoniae*, *H influenzae*, and *M catarrhalis* are present in concentrations more elevated than those of other organisms, which would support their pathogenic role in the exacerbation, according to other authors.⁵

José Antonio Martínez, M.D.,
Eugenio Rodríguez, M.D.,
Teresa Bastida, M.D.,
Jordi Bugés, M.D., and
Miguel Torres, M.D.,
Hospital de L'Esperit Sant,
Santa Coloma de Gramenet,
Barcelona, Spain

REFERENCES

- 1 Tager I, Speizer FE. Role of infection in chronic bronchitis. *N Engl J Med* 1975; 292:563-69
- 2 Chodosh S. Sputum evaluation: why, when, how and by whom. In: Brody JS, Sneider GL, eds. Current topics in the management of respiratory diseases. New York: Churchill Livingstone, 1985; 123-45
- 3 Sachs FL. Chronic bronchitis. In: Pennington JE, ed. Respiratory infections: diagnosis and treatment. New York: Raven Press, 1988; 142-58
- 4 Winterbauer RH, Hutchinson JF, Reinhardt GN, Sumida SE, Dearden B, Thomas CA, et al. The use of quantitative cultures and antibody coating of bacteria to diagnose bacterial pneumonia by fiberoptic bronchoscopy. *Am Rev Respir Dis* 1983; 128:98-103
- 5 Vereen L, Smart LM, George RE. Antibody coating and quantitative cultures of bacteria in sputum and bronchial brush specimens from patients with stable chronic bronchitis. *Chest* 1986; 90:534-36

Iatrogenic Aspiration Follow-Up

To the Editor:

This letter is a follow-up to my previous article entitled Iatrogenic Aspiration of Components of Respiratory Care Equipment, which was published in the March, 1993 issue of *Chest* (*Chest* 1993; 103:964-165). It has come to my attention that Ballard Medical Products has modified the configuration of their Trach Care Suction catheter such that the washer is now contained within a glued cartridge. This modification seems to have avoided the potential hazard we have previously described from its improper disassembly in the previous configuration while the Ballard closed system catheter has always been a useful tool in the ICU, this improved product modification will prevent improper disassembly of the catheter unit and thus the possibility of an aspirated washer is very unlikely to occur.

Steven R. Mohnssen, M.D., F.C.C.P.,
Columbus Internal Medicine Associates,
Columbus, Indiana

Cyclophosphamide induces false-positive results in detection of aspergillus antigen in urine

K Hashiguchi, Y Niki and R Soejima
Chest 1994;105;975-976

This information is current as of June 11, 2008

Updated Information & Services	Updated information and services, including high-resolution figures, can be found at: http://chestjournal.org
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://chestjournal.org/misc/reprints.shtml
Reprints	Information about ordering reprints can be found online: http://chestjournal.org/misc/reprints.shtml
Email alerting service	Receive free email alerts when new articles cite this article sign up in the box at the top right corner of the online article.
Images in PowerPoint format	Figures that appear in CHEST articles can be downloaded for teaching purposes in PowerPoint slide format. See any online article figure for directions.

A M E R I C A N C O L L E G E O F



P H Y S I C I A N S[®]