Herpes Zoster (Shingles) Ophthalmicus

Chitin and chitosan oligosaccharides: 6 units per molecule

2001

12/18/01: Onset of left eye, forehead and ear pain.
12/19/01: Onset of blisters, increasing deep pain.
12/20/01: Photograph taken by her husband, George.
12/20/01: Started on Valacyclovir HCl by her M.D.

2003

September 5, 2003: Asymptomatic and well. The painful shingles was a wake-up call to improve her immune system. She embarked on a Wellness Program and she feels just great!

12/22/01: Skin lesions resolving. However, increasing eye pain so she started taking chitin products.
12/24/01: Decreasing eye pain with the addition of the chitin products. Skin lesions healing.
12/26/01: Yesterday was Christmas Day. She is all smiles. There is so much to learn about the chitin products.

Observations on a second case of Herpes Zoster Ophthalmicus: a more effective program.

Our second case of Herpes Zoster Ophthalmicus was an elderly gentleman who informed us that he was asymptomatic within 48 hours after taking valacyclovir, chitin soft gel capsule and chitin granules in packets for two days. The excruciating pain was completely gone after 48 hours. 1994-2004: 10 years of observations!

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Please visit our website: www.seaborne.com or our Kaimuki Office if you are interested in learning about the chitin products and the business opportunities of this Hawaii based networking company: a member of DSA since 1994.

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Cover art by Dietrich Varez, Volcano, Hawaii. All rights reserved by the artist.
‘Ohe Hano Ihu
Depicting a Hawaiian nose flute.
Editorial

Hot Spots in Dermatology is a very unique annual seminar put on in Hawaii by Dr. David Elpern and Dr. Doug Johnson. For more than 20 years David, a dermatologist formerly at the Wilcox Clinic on Kauai and now practicing in Williamstown, Massachusetts, has been able to get together a small group of local, mainland and international attendees and speakers to not just discuss clinical and research aspects of Dermatology but the Art of Dermatology. He has also started an art/science/history of Dermatology website at Dermancies.com. This free online journal produced with Benjamin Barakin M.D. of Edmonton, Canada emphasizes “patient care, physician experiences and the interplay of medicine with the social and psychological sciences.” And this is what the attendees at the Hot Spots get every year.

The August 2004 Hot Spots held on Kauai was no exception. Subjects presented included Contact Dermatitis updates, Botox Hawaii: personal experiences as well as confessions of a nihilist and Miranda’s Promise.

Miranda’s Promise: a student intern’s dermatology diary, January 22, 2004, was presented by Caitlin Elena Stiglmeier, who spent a year in Dr. David Elpern’s office in Williamstown. Her presentation was truly impressive, received a standing ovation from the audience (not usually done at a medical meeting) and was published in the International Journal of Dermatology 2004, 43: 915-916. It is reprinted with permission of the International Journal of Dermatology on page 18.

When I asked Caitlin for her bio to introduce Miranda’s Promise, she sent another literary masterpiece printed on page 19.

David, mahalo for stimulating Caitlin in her year with you, and continuing to encourage her in medicine. One person, a mentor, can make a phenomenal impression on a student like Caitlin Stiglmeier.

Miranda’s Promise

Caitlin being attentive to the last patient of the day.
For your patients requiring cardiac care, there is no better choice than the Straub Heart Center. We offer the broadest range of cardiac specialty care with the greatest depth of expertise in the state. Our outstanding team of physicians and medical professionals are dedicated to working closely with you to ensure that your patient will receive the highest level of cardiac care.

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Erythromycin-induced Resistance to Clindamycin in Staphylococcus aureus

Jonathan K. Marr MD, Audrey T. Lim MT, and Loren G. Yamamoto MD, MPH, MBA

Abstract

Purpose: To describe the incidence of erythromycin-induced resistance to clindamycin in a sample of Staphylococcus aureus isolates.

Methods: 100 erythromycin-resistant and clindamycin-sensitive S. aureus were collected as a convenience sample from February to August 2003. Inducible clindamycin resistance was identified using the D-zone disc method.

Results: Of the 100 Staphylococcus aureus isolates, 64 were methicillin sensitive (MSSA) and 36 were methicillin resistant (MRSA). Of the 64 MSSA isolates, 22 (34%) had inducible resistance. Of the 36 MRSA isolates, 4 (11%) had inducible resistance. Overall, 26% of these clindamycin sensitive S. aureus isolates, exhibited inducible resistance to clindamycin.

Conclusions: In this sample, MSSA isolates were almost three times more likely to have inducible MLS resistance compared to MRSA isolates. Inhibible resistance may compromise the efficacy of clindamycin. The frequency of inducible resistance in this series of "clindamycin sensitive" S. aureus isolates is 26%. It is likely that the true percentage of clindamycin resistance is being underestimated since testing for inducible resistance is not routinely performed.

Introduction

Rates of community-acquired methicillin-resistant Staphylococcal aureus (MRSA) carriage and infections have been increasing. Transitioning to oral outpatient treatment of such infections, especially in children, is often limited to clindamycin since erythromycin, tetracycline, and quinalone antibiotics have limited efficacy or undesirable side effects. A recent article concluded that clindamycin was effective in treating children with invasive infections caused by susceptible community-acquired-MRSA isolates. However, it should be noted that hospital acquired MRSA isolates are more commonly clindamycin resistant.

Macrolides (e.g., erythromycin), lincosamides (e.g., clindamycin; trade name Cleocin), and streptogramins (e.g., quinupristin-dalfopristin; trade name Synercid) are antimicrobial agents active against Gram-positive bacteria and some Gram-negative cocci. Streptogramins are commonly used in the cattle industry (e.g., virginiamycin). These three groups are collectively known as "MLS" (macrolide-lincosamide-streptogramin) antibiotics. They are chemically distinct, but alike in their mode of action, which inhibits protein synthesis by binding to the 50S ribosomal subunits. Since the introduction of erythromycin, macrolide-resistant S. aureus have appeared along with acquired macrolide-resistance and resistance to other MLS antibiotics. Resistance to antimicrobial therapy has become an increasing concern among physicians. Clindamycin is more commonly employed for the outpatient treatment of infections with suspected Staphylococcus aureus, since methicillin/oxacillin and cephalosporin resistance rates are rising.

The mechanism of macrolide resistance is briefly described in the footnote below*, but of clinical importance, is that some S. aureus organisms that are clindamycin-susceptible and erythromycin-resistant based on in vitro testing, will behave as though they are clindamycin-resistant in the presence of erythromycin. In other words, erythromycin, induces clindamycin resistance may be due to one of three mechanisms, but the best known mechanism has been target site modification caused by methylation of adenine nucleotides in the 23S subunit of the 50S ribosomal RNA. Specifically, methylation reduces the ability of macrolides, lincosamides, and type-B streptogramins to bind to the ribosomal subunits, thereby allowing protein synthesis to continue. In staphylococci and streptococci, a methylating enzyme present can be repressed in sensitive bacteria, but in the presence of subinhibitory concentrations of macrolides, the gene that confers resistance becomes expressed and the enzyme is induced. Cross-resistance between all macrolides, lincosamides (clindamycin and lincomycin), and streptogramins B (pristinamycin I, quinupristin, and virginiamycin S) defining the MLS phenotype, occurs because of overlapping binding sites of these antimicrobials. Although other mechanisms of resistance to macrolides have been reported, ribosomal methylation remains the most prevalent mechanism. Biochemical studies demonstrate that the erm (erythromycin resistance methylase) genes encode the methylases that cause ribosomal modification leading to resistance.

* Macrolide resistance may be due to one of three mechanisms, but the best known mechanism has been target site modification caused by methylation of adenine nucleotides in the 23S subunit of the 50S ribosomal RNA. Specifically, methylation reduces the ability of macrolides, lincosamides, and type-B streptogramins to bind to the ribosomal subunits, thereby allowing protein synthesis to continue. In staphylococci and streptococci, a methylating enzyme present can be repressed in sensitive bacteria, but in the presence of subinhibitory concentrations of macrolides, the gene that confers resistance becomes expressed and the enzyme is induced.
resistance in some of these organisms. Erythromycin is one of the most effective inducers of resistance, but lincosamides (clindamycin) have been known to induce resistance resulting in subsequent treatment failure in patient infections with these S. aureus isolates. Thus, although the lab reports the organism as being clindamycin sensitive, the organism behaves as if it is clindamycin resistant. This phenomenon is known as MLS inducible resistance, since any MLS antibiotic can theoretically induce resistance. MLS resistance is well known in the infectious disease literature, but it is less well discussed in the primary care, emergency medicine and general hospital care literature. The purpose of this report is to determine the frequency of erythromycin-induced clindamycin resistance in a sample of S. aureus isolates in Honolulu.

**Methods**

One hundred erythromycin-resistant and clindamycin-sensitive Staphylococcus aureus isolates were prospectively obtained from Clinical Laboratories of Hawaii from February 2003 to August of 2003 (includes outpatient and inpatient, community and hospital acquired). All strains were classified by susceptibilities to clindamycin and erythromycin with the Vitek system (Vitek, Hazelwood, MO). Isolates were tested for inducible clindamycin-resistance using the disc method described by Weisblum and Demohn. Absence of inducible resistance (true clindamycin sensitivity) shows a normal clear zone around the clindamycin disc, even in the presence of erythromycin (Figure 1). Erythromycin-induced resistance to clindamycin shows growth into the clindamycin inhibition zone adjacent to the erythromycin disc (Figure 2).

In other words, next to the erythromycin disk, the clindamycin zone of inhibition is small, demonstrating that the presence of erythromycin induces resistance to clindamycin. In the absence of erythromycin, the clindamycin inhibition zone is large. This phenomenon is also called D-zone resistance, since the clindamycin inhibition zone is shaped like the letter D.

**Results**

Of the 100 S. aureus isolates, 64 were methicillin-sensitive (MSSA) and 36 were methicillin-resistant (MRSA). Of the 64 MSSA isolates, 22 (34%) had inducible resistance. Of the 36 MRSA isolates, 4 (11%) had inducible resistance. Overall, 26% of these “clindamycin sensitive” S. aureus isolates exhibited erythromycin-induced resistance to clindamycin. See Table 1.

**Discussion**

Conventional testing may be underestimating the clindamycin resistance rate. From our data, 26% of S. aureus isolates sensitive to clindamycin based on
conventional testing, exhibited clindamycin resistance in the presence of erythromycin. Data comparisons between methicillin-sensitive (MSSA) and methicillin-resistant S. aureus (MRSA), suggest that MSSA isolates are three-times more likely to have inducible-resistance than MRSA.

There have been recent case reports of inducible-resistance of staphylococcal isolates during therapy while on clindamycin. Overall, organisms are becoming increasingly resistant to current antibiotics despite attempted changes in physician prescribing behavior. In Honolulu, clindamycin resistance rates for S. aureus have slowly risen. Data obtained from Clinical Laboratories of Hawaii show that clindamycin-resistance in S. aureus was 2% in 1999 (see Table 2). In 2003, clindamycin-resistant S. aureus isolates increased to 15%; a seven-fold increase over 5 years. The in vivo resistance rates are likely to be higher than this since inducible resistance is not detectable by conventional antibiotic sensitivity determinations.

We did not examine the clinical records of these patients. Nor did we stratify the S. aureus isolates by age group, specimen source or inpatient/outpatient. Furthermore, the isolates were not tested for the erm gene (see footnote*). Thus we were unable to definitively determine whether the inducible resistance was due to methylation or from one of the less common mechanisms.

MRSA comprises approximately 25% of S. aureus isolates in Honolulu, reducing the efficacy rate of anti-staphylococcal penicillins (e.g., methicillin, oxacillin, dicloxacillin) and cephalosporins. Clindamycin is an available oral alternative for S. aureus infections. Trimethoprim-sulfamethoxazole, doxycycline (not suitable for young children), rifampin and the very expensive drug, linezolid are other alternatives. Since the differential of causative microbial agents for soft tissue infections, often includes group A beta hemolytic streptococci (GABHS) and S. aureus together, clindamycin potentially covers these two well. The potential for inducible resistance to clindamycin reduces the efficacy certainty of clindamycin therapy. Additionally, inducible MLS inducible resistance is also exhibited by strains of GABHS.

Increasing awareness of inducible resistance should be brought to the attention of primary care physicians, emergency physicians and hospital based physicians, treating potentially serious S. aureus infections such as cellulitis, septic arthritis, osteomyelitis, abscesses, staphylococcal pneumonia, bronchiectasis, bacterial endocarditis, bacterial pericarditis, etc. For serious and life-threatening infections with S. aureus, clindamycin’s sensitivity rate is not good enough. The potential for inducible resistance further compromises the efficacy of clindamycin. Once the organism is identified, if clindamycin therapy is being considered, clindamycin sensitivity testing should ideally include testing for inducible resistance since conventional testing does not identify inducible resistance.

Additionally, there should be more judicious use (i.e., less use) of macrolides (e.g., azithromycin and clarithromycin) and clindamycin since both have been implicated as inducers of the resistance in S. aureus. However, an ideal practice parameter to determine appropriate use is difficult to develop.

Pediatric data suggests that community acquired MRSA can be treated with clindamycin, but this has the potential for the development of inducible resistance and possible treatment failure while on therapy. In summary, inducible resistance to clindamycin may compromise the efficacy of clindamycin. The frequency of inducible resistance in this series of “clindamycin sensitive” S. aureus isolates is 26%. It is likely that the true percentage of clindamycin resistance is being underestimated since testing for inducible MLS resistance is not routinely performed.

References
Insulinoma, A Rare Neuroendocrine Tumor: A Case Report

Jane Ellaine F. Tongson-Ignacio MD, Stacey A.A. Honda MD, PhD, and Nadhipuram V. Bhagavanan PhD

Abstract
We report a case of Insulinoma, a rare neuroendocrine tumor with an incidence of approximately four per 5 million. This case demonstrates the characteristic clinical, biochemical and histological features of an insulinoma, a rare benign neuroendocrine tumor where early recognition is important to ensure proper surgical treatment and prevent serious adverse consequences.

Case Report
A 46 year old female presented to the emergency department with seizures. Her serum glucose level was 28mg/dl (70-110 mg/dl). She denied any use of oral hypoglycemic agents or insulin intake. The patient was treated with dextrose infusion with serum glucose levels ranging from 50-60 mg/dl. While in the emergency department the patient became sweaty and lethargic. Physical examination revealed an obese patient (208 lbs) with normal vital signs, but was otherwise unremarkable. Past medical history revealed subtotal thyroidectomy for Graves disease, cholecystectomy for hepatobiliary hemangioblastoma without any recurrence, and episodes of disorientation which was thought to be transient near syncope with undetermined etiology. She was subsequently diagnosed with seizure disorder controlled with medications.

The patient was subsequently admitted to the hospital for further investigations. During a 24 hour fast, her blood glucose decreased to 48mg/dl, but she was entirely asymptomatic. The serum glucose with exercise was monitored and ranged from 45-50 mg/dl. During a 36-hour test, the patient remained asymptomatic. The etiology of the hypoglycemia remained unknown. However, approximately thirty minutes after meals, she developed diaphoresis, lethargy and mild tremulousness. Blood glucose at that time was 28mg/dl. The patient was treated with dextrose 50 intravenously with resolution of symptoms. Thirty minutes later, she developed recurrent symptoms with a blood glucose level of 35 mg/dl. Again she was given dextrose 50 with resolution of symptoms. At this point, the patient was placed on dextrose 10 overnight with no further symptoms observed. The following day for the entire 24 to 36 hour period, the patient was off of dextrose 10 and remained asymptomatic. The blood glucose ranged from 48 to 80mg/dl. Further testing showed a negative sulfonamide screen, normal somatostatin-C and within normal limits liver function tests and insulin antibodies (normal range: 1.1% or less).

The CT scan of the abdomen revealed no evidence of any lesions in the liver or any evidence for an abdominal tumor that might be a secondary cause for her hyperinsulinemic levels. The patient was subsequently discharged with a diagnosis of postprandial hypoglycemia with the possibility of an insulinoma. She was subsequently referred to endocrinology for consultation and was readmitted for a 72 hour fast. On the 40th hour of the fast, she started to develop blurring of vision and her laboratory tests showed the following: Blood glucose of 32 mg/dl (70-110 mg/dl), Insulin level 32μU/ml (0-22μU/ml), and C-peptide 3.5mg/ml (0.5-3.0 mg/ml). The symptoms were relieved with administration of Dextrose 50. These studies showing fasting hypoglycemia accompanied by symptoms and reversal of the findings after administration of glucose are conclusive for an insulinoma.

A localization test by calcium arterial stimulation test revealed greater than a 200 fold rise in insulin in the superior mesenteric artery. This suggested that the patient’s insulinoma was located in the uncinate process. The patient underwent exploratory laparotomy enucleating the 1.5-cm insulinoma that was on the surface of the uncinate process of the pancreas. Intra-operative ultrasound of the rest of the pancreas found no evidence of other lesions. The patient’s symptoms resolved after the surgery and random serum glucose levels returned to normal 96mg/dl (60-200 mg/dl).

Pathologic Findings
The gross specimen revealed a friable lobulated pink mass measuring 1.7 x 1.5 x 1.1cm. Histologic examination revealed a well circumscribed tumor nodule composed of endocrine type cells with round uniform nuclei and basophilic cytoplasm. The pattern of growth was primarily solid with intervening vascularized stroma (Figure 1). There was no evidence of atypia or increased mitotic activity. The lesion appeared to be separated from the pancreas by a fibrous band. Majority of the tumor cells showed positive staining for insulin on immunohistochemical stain (Figure 2).
Self-reporting of Internal Medicine House Staff Work Hours

David L. Saunders MD, MPH, Kimberly C. Kehoe MD, Vivian H. Rinehart, and Benjamin W. Berg MD

Abstract

Introduction: The 80-hour workweek became a reality for residency programs nationwide on July 1, 2003. In this review of administrative data, we examine the self-reporting of work hours by a cohort of Internal Medicine residents.

Methods: Data was collected from 27 residents in training at Tripler Army Medical Center over a 4 month period from September 1 to December 31, 2002. House staff reported their hours on a daily basis by responding to an email message, as well as on a monthly basis utilizing the Army’s UCAPERs (Uniform Chart of Accountability System) mandatory monthly workload tracking system. Data from the two separate reporting systems was compared for accuracy, completeness and internal consistency.

Results: Compliance with daily reporting was variable (67-97% with overall compliance rate of 86%) but lower when compared with the mandatory military monthly reporting system (95-100%). There were large differences in reporting of average weekly work hours among individual residents when monthly reporting was compared to daily reporting of data with higher averages with monthly data reporting. Weekly totals averaged nearly 12 hours higher when reported monthly compared to reporting on a daily basis (p < 0.0001). A total of 18 residents reported that they worked more than 80 hours per week during one month using monthly data, while only 7 reported that they averaged more than 80 hours with the daily reporting data. When average weekly hours reported on a daily basis were compared with the total number of inpatient days worked over the four month period using a simple regression model, there was a significant relationship with average hours increasing with increasing number of inpatient days worked (adjusted R square = 0.19, p = 0.01).

Conclusions: Little internal consistency was found in the comparison of daily versus monthly work hour reporting, indicating that self-reporting may not provide accurate data. Compliance with the 80-hour workweek is crucial for residency programs to maintain accreditation, and thus programs will need a way to accurately capture consistent resident work hour data. Further studies are indicated to determine the most accurate way of assessing house staff work hours.

Introduction

The Association of American Medical Colleges (AAMC) and Accreditation Council for Graduation Medical Education (ACGME) have mandated an 80-hour workweek for resident physicians in training, and this has become the accepted standard throughout the country as of July 1, 2003. Residency programs in New York have had similar laws regulating resident work hours since July 1989. However, recent studies have shown that compliance remains a major issue. There is little scientific data in the literature on the quality or validity of work hour data or how it is currently collected. The typical method used by most programs is resident self-reported hours on an “honor system” basis without mechanisms to verify or validate the data. Our goal in this review was to define the accuracy of self-reported work hour data from a cohort in an Internal Medicine Residency.

Methods

The Tripler Army Medical Center (TAMC) Internal Medicine Residency program is an ACGME accredited military residency averaging 24 residents in training. In this retrospective review of administrative data, house staff reported their hours on a daily basis by responding to an email message. This required roughly 3-4 keystrokes daily to complete. Policy was widely disseminated through house staff meetings, the house staff manual and personal communications in addition to daily e-mail. Data from September 1 to December 31, 2002 was reviewed. Residents worked a total of 125 4-week blocks over this period of which 70 were inpatient rotations (56% of the total). There were 27 residents in training (7 female, 10 PGY-1, 8 PGY-2, 9 PGY-3) with an average age of 28 years who reported their work hours. This data was then compared to the Army’s UCAPERs (Uniform Chart of Accountability System) mandatory monthly workload tracking system for the same period in an attempt to validate the usefulness of self-reporting. All Army personnel are required to enter this data monthly. This monthly requirement does not have a specific mandated frequency of data entry (unstructured monthly reporting). If data was not self-reported, scheduled work hours were used, and it was assumed that house staff had 1 day off per week.
Daily reported data was adjusted for compliance with an assumption that average hours were roughly the same for individual residents on days that were not reported. Two out of 27 residents did not provide data as they did not report their work hours on a daily basis at all. The daily self-reported data on average weekly work hours was compared using simple regression with the total number of days worked by each resident on inpatient rotations (which typically account for the highest average weekly work hours). Data was tabulated and statistical analysis was performed using Microsoft Excel 2000.

Results

Individual compliance with daily reporting was variable, ranging from 59-97% with overall compliance rate of 86%. Quartile means for compliance were 79% for the lowest quartile and 94% for 3rd quartile (n=25). Compliance with the monthly reporting system is mandatory. In a few cases where monthly reports were not submitted in a timely fashion, monthly data was completed by program staff using scheduled work hours.

There were large differences in reporting of average weekly work hours among individual residents when monthly and daily reporting methods were compared (see figure 1). The range was from +34 to -6 hours per week. The vast majority of residents (23/25) reported higher average hours with monthly reporting than they did with daily reporting.

When adjusted for compliance, aggregated mean hours using daily reporting were 61.5 per week (standard deviation 8.6) versus 71 hours per week (std. dev. 10.6) with monthly reporting (average difference was 9 hours per week) for interns. For residents, the aggregate difference was greater with an average of 54 hours per week (std. dev. 7.0) with daily reporting versus 68 hours per week (std. dev. 9.6) with monthly reporting for an average difference of +14 hours per week (see figure 2). The difference in mean work hours for all house staff was 11.9.

Figure 3 shows the number of residents reporting that they worked more than an average of 80 hours per week by month. A total of 18 residents reported that they worked more than 80 hours per week during a single month using monthly data, while only 7 reported that they averaged more than 80 hours with daily reported data.

Average weekly hours reported on a daily basis were compared with the total number of inpatient days worked over the four month period using a simple regression model. There was a significant positive relationship between average weekly work hours and number of inpatient days worked (adjusted R square = 0.19, p=0.01, see Figure 4). There was no significant relationship between average weekly hours reported on a monthly basis and number of inpatient days worked (p=0.3).
Residents with a high compliance rate for the reporting itself, but clear discrepancies in the number of hours reported. Although this data is reported from a single institution over a 4 month period, it seems unlikely that significant differences in the accuracy of self-reported data would be found at other institutions. On a reassuring note, weekly house staff hours for both residents and interns in Internal Medicine at TAMC were both well below the mandated standard when averaged over 4 months.

Studies are needed to determine the most accurate way of assessing house staff work hours to produce data of sufficient quality on which to base legislation and regulatory decisions. However, it has yet to be established that an 80 hour work week by medical house staff will lead to a reduction in diagnostic and treatment-related errors or improved patient outcomes. In fact, recent data from an academic medical center found no relationship between prescribing errors and resident work hours. Early reports from the media and academic sources indicate that the restrictions have been difficult to implement with 92 citations for work hours violations issued to 1,753 residency programs reviewed by ACGME in the first year. Questions have also been raised regarding the potential negative impact of restrictions on the quality of GME training programs, and the continuity of patient care and safety. Raw work-hour numbers do not provide any indication of the amount of time spent in actual diagnostic and treatment decisions versus administrative tasks, the actual amount of responsibility delegated to that individual for a given treatment decision by a particular supervising physician, the degree of supervision provided while doing invasive procedures, the number of patients that the resident was responsible for at a given time, the amount of sleep that the individual got on call, or the acuity and volume of patients admitted or treated on cross-cover duties. These and other factors introduce a great deal of variability and complexity into the larger task of improving patient safety which recent legislation has attempted to address.

Conclusions

In comparing the two methods of self reporting work hours, we found little internal consistency between daily and monthly self-reported work hours. Self reported work hours vary considerably depending on the method of collection. Compliance policy for the 80 hour work week should be based on reliable and consistent strategies to collect work hours. Such methods have yet to be defined. ACGME program requirements and legal mandates demand urgent validation of standardized data collection methods. Monthly self-reporting appears on average to inflate actual hours worked by over 20% (up to 12 hours per week on average) compared with a daily assessment in our program. Daily reporting was cumbersome, and compliance was only 86% for participating residents. This experience reinforces a need to accurately collect work hour data if we are to structure learning experiences efficiently and effectively.

There are important incentives which introduce biases in self-reported work hour data. Residents may feel that they are overworked and may inflate their hours to bring about changes in scheduling policies. Conversely, aware that program accreditation now rests in part on newly implemented work-hour standards, they may underreport data to prevent their program from being sanctioned by regulatory agencies. Finally, depending on the frequency of data collection (eg. monthly, weekly, daily) – residents may simply have difficulty actually recalling the exact hours that they worked, and may also intensifying efforts at data collection as simply another administrative task to be dispensed with expeditiously. The biases are problematic for legislation and regulatory compliance decisions based on self-reported data. This study points out the inherent problems among a group of motivated residents.

References

ectopy. He had no chest pain. At the completion of this treatment he had improvement of the quadranopsia and right arm weakness but still was incomplete. He was returned to the ward and within the next 24 hours, the EKG changes spontaneously remitted. On that day (day 3), his CPK was 981, MB 15, MB2, and Troponin 1.6. He was retreated once again for persistent right quadranopsia and right arm weakness at 60 fsw on 100% oxygen. At the completion of this treatment he had complete resolution of the quadranopsia and right arm weakness. On the following day, his EKG remained normal, he had no chest pain, his labs showed a CPK of 701, MB 5, MB2 1, and Troponin 1.05. No additional recompression treatments were undertaken. Within the next twenty-four hours, he had an echocardiogram which demonstrated an ejection fraction of 76% and no ASD/PFO; gated myocardial perfusion imaging at rest and with exercise which was completely normal; an exercise treadmill test which ran for 11 minutes and 19 seconds to 95% of predicted, with a few PACs, and no ischemic changes; a brain MRI which showed densities in the ACA-MCA region, and a brain MRA which showed no hemodynamic stenosis. He was subsequently discharged from further care and advised to refrain from diving for a minimum of six weeks.

Discussion
Over the past twenty years, the HTC has treated over 100 cases of arterial gas embolism with tourist divers being affected at twice the rate of Hawaii residents. In the setting of diving, breath holding while breathing compressed gas and ascending in the water column is the inciting action which leads to over-inflation of the lungs according to Boyle’s Law. This situation usually occurs as a result of panic developing in an “out of air” emergency or with buoyancy control problems. Arterial gas embolism most commonly results from pulmonary barotrauma where the breathing gas gains direct access to the pulmonary vasculature and is transported to the brain. Cases of suspected coronary embolization have also been reported. Symptoms develop during or immediately after surfacing. The history and physical findings in this case presentation leave no question as to the diagnosis of cerebral arterial gas embolism. Given the apparent rarity of coronary arterial gas embolization, the question in this case was whether there was a concomitant embolic event involving a coronary artery. Cardiac dysrhythmias and CPK elevations, including MB fraction, have been associated with cerebral emboli alone without any cardiac manifestations. Additionally it may be possible that the bubbles entering the cerebral circulation initiate hyperactivity of the autonomic nervous system resulting in cardiovascular dysfunction. Troponin I, however, is quite cardiосpecific for myocardial damage and the EKG changes in this case are more ischemic in nature. Thus direct cardiac injury did occur during this event. The question then arises: did this patient have some pre-existing coronary artery disease which under the stress of this emergency manifested itself? The nuclear imaging studies did not show any perfusion deficits, nor were there any ischemic changes induced while on the treadmill. The transient rise in his cardiac enzymes remained somewhat low and dissipated rapidly and coincidentally with his treatment and speedy recovery. These findings, in addition to his level of fitness and lack of pre-existing cardiac risk factors would tend to support a diagnosis of concomitant cerebral and coronary arterial gas emboli.

The definitive treatment for arterial gas embolism is recompression to reduce the size of the offending bubbles and to deliver hyperbaric oxygen to those tissues that are hypoxic and in danger of cellular death. In this case, the patient was initially treated at 160 fsw using a gas mixture designed to limit any additional nitrogen uptake while providing 2.9 atmospheres absolute (atm abs) of oxygen to the tissues. Follow-up treatments were conducted at 60 fsw on 100% oxygen which provides 2.8 atm abs of oxygen.

Conclusion
This sport diver suffered concomitant cerebral and coronary gas emboli. He was treated successfully and made a complete recovery without any residual symptoms. This is the first case to be so reported.

References

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Self-reporting of Internal Medicine House Staff Work Hours

David L. Saunders MD, MPH, Kimberly C. Kehoe MD, Vivian H. Rinehart, and Benjamin W. Berg MD

Abstract

Introduction: The 80-hour workweek became a reality for residency programs nationwide on July 1, 2003. In this review of administrative data, we examine the self-reporting of work hours by a cohort of Internal Medicine residents.

Methods: Data was collected from 27 residents in training at Tripler Army Medical Center over a 4 month period from September 1 to December 31 2002. House staff reported their hours on a daily basis by responding to an email message, as well as on a monthly basis utilizing the Army’s UCAPERs (Uniform Chart of Account Personnel System) mandatory monthly workload tracking system. Data from the two separate reporting systems was compared for accuracy, completeness and internal consistency.

Results: Compliance with daily reporting was variable (67-97% with overall compliance rate of 86%) but lower when compared with the mandatory military monthly reporting system (95-100%). There were large differences in reporting of average weekly work hours among individual residents when monthly reporting was compared to daily reporting of data with higher averages with monthly data reporting. Weekly totals averaged nearly 12 hours higher when reported monthly compared to reporting on a daily basis (p < 0.0001). A total of 18 residents reported that they worked more than 80 hours per week during one month using monthly data, while only 7 reported that they averaged more than 80 hours with the daily reporting data. When average weekly hours reported on a daily basis were compared with the total number of inpatient days worked over the four month period using a simple regression model, there was a significant relationship with average hours increasing with increasing number of inpatient days worked (adjusted R square = 0.19, p = 0.01).

Conclusions: Little internal consistency was found in the comparison of daily versus monthly work hour reporting, indicating that self-reporting may not provide accurate data. Complying with the 80-hour workweek is crucial for residency programs to maintain accreditation, and thus programs will need a way to accurately capture consistent resident work hour data. Further studies are indicated to determine the most accurate way of assessing house staff work hours.

Introduction

The Association of American Medical Colleges (AAMC) and Accreditation Council for Graduation Medical Education (ACGME) have mandated an 80-hour workweek for resident physicians in training, and this has become the accepted standard throughout the country as of July 1, 2003. Residency programs in New York have had similar laws regulating resident work hours since July 1989. However, recent studies have shown that compliance remains a major issue. There is little scientific data in the literature on the quality or validity of work hour data or how it is currently collected. The typical method used by most programs is resident self-reported hours on an “honor system” basis without mechanisms to verify or validate the data. Our goal in this review was to define the accuracy of self-reported work hour data from a cohort in an Internal Medicine Residency.

Methods

The Tripler Army Medical Center (TAMC) Internal Medicine Residency program is an ACGME accredited military residency averaging 24 residents in training. In this retrospective review of administrative data, house staff reported their hours on a daily basis by responding to an email message. This required roughly 3-4 keystrokes daily to complete. Policy was widely disseminated through house staff meetings, the house staff manual and personal communications in addition to daily e-mail. Data from September 1 to December 31 2002 was reviewed. Residents worked a total of 125 4-week blocks over this period of which 70 were inpatient rotations (56% of the total). There were 27 residents in training (7 female, 10 PGY-1, 8 PGY-2, 9 PGY-3) with an average age of 28 years who reported their work hours. This data was then compared to the Army’s UCAPERs (Uniform Chart of Account Personnel System) mandatory monthly workload tracking system for the same period in an attempt to validate the usefulness of self-reporting. All Army personnel are required to enter this data monthly. This monthly requirement does not have a specific mandated frequency of data entry (unstructured monthly reporting). If data was not self-reported, scheduled work hours were used, and it was assumed that house staff had 1 day off per week.
Daily reported data was adjusted for compliance with an assumption that average hours were roughly the same for individual residents on days that were not reported. Two out of 27 residents did not provide data as they did not report their work hours on a daily basis at all. The daily self-reported data on average weekly work hours was compared using simple regression with the total number of days worked by each resident on inpatient rotations (which typically account for the highest average weekly work hours). Data was tabulated and statistical analysis was performed using Microsoft Excel 2000.

**Results**

Individual compliance with daily reporting was variable, ranging from 59-97% with overall compliance rate of 86%. Quartile means for compliance were 79% for the lowest quartile and 94% for 3rd quartile (n=25). Compliance with the monthly reporting system is mandatory. In a few cases where monthly reports were not submitted in a timely fashion, monthly data was completed by program staff using scheduled work hours.

There were large differences in reporting of average weekly work hours among individual residents when monthly and daily reporting methods were compared (see figure 1). The range was from +34 to -6 hours per week. The vast majority of residents (23/25) reported higher average hours with monthly reporting than they did with daily reporting.

When adjusted for compliance, aggregated mean hours using daily reporting were 61.5 per week (standard deviation 8.6) versus 71 hours per week (std. dev. 10.6) with monthly reporting (average difference was +9 hours per week) for interns. For residents, the aggregate difference was greater with an average of 54 hours per week (std. dev. 7.0) with daily reporting versus 68 hours per week (std. dev. 9.6) with monthly reporting for an average difference of +14 hours per week (see figure 2). The difference in mean work hours for all house staff was 11.9.

Figure 3 shows the number of residents reporting that they worked more than an average of 80 hours per week by month. A total of 18 residents reported that they worked more than 80 hours per week during a single month using monthly data, while only 7 reported that they averaged more than 80 hours with daily reported data.

Average weekly hours reported on a daily basis were compared with the total number of inpatient days worked over the four month period using a simple regression model. There was a significant positive relationship between average weekly work hours and number of inpatient days worked (adjusted R square = 0.19, p = 0.01, see Figure 4). There was no significant relationship between average weekly hours reported on a monthly basis and number of inpatient days worked (p=0.3).
Conclusions
In comparing the two methods of self reporting work hours, we found little internal consistency between daily and monthly self-reported work hours. Self reported work hours vary considerably depending on the method of collection. Compliance policy for the 80 hour work week should be based on reliable and consistent strategies to collect work hours. Such methods have yet to be defined. ACGME program requirements and legal mandates demand urgent validation of standardized data collection methods. Monthly self-reporting appears on average to inflate actual hours worked by over 20% (up to 12 hours per week on average) compared with a daily assessment in our program. Daily reporting was cumbersome, and compliance was only 86% for participating residents. This experience reinforces a need to accurately collect work hour data if we are to structure learning experiences efficiently and effectively.

There are important incentives which introduce biases in self-reported work hour data. Residents may feel that they are overworked and may inflate their hours to bring about changes in scheduling policies. Conversely, aware that program accreditation now rests in part on newly implemented work-hour standards, they may underreport data to prevent their program from being sanctioned by regulatory agencies. Finally, depending on the frequency of data collection (eg. monthly, weekly, daily) – residents may simply have difficulty actually recalling the exact hours that they worked, and may see the recently intensifying efforts at data collection as simply another administrative task to be dispensed with expeditiously. The biases are problematic for legislation and regulatory compliance decisions based on self-reported data. This study points out the inherent problems among a group of motivated residents with a high compliance rate for the reporting itself, but clear discrepancies in the number of hours reported. Although this data is reported from a single institution over a 4 month period, it seems unlikely that significant differences in the accuracy of self-reported data would be found at other institutions. On a reassuring note, weekly house staff hours for both residents and interns in Internal Medicine at TAMC were both well below the mandated standard when averaged over 4 months.

Studies are needed to determine the most accurate way of assessing house staff work hours to produce data of sufficient quality on which to base legislation and regulatory decisions. However, it is has yet to be established that an 80 hour work week by medical house staff will lead to a reduction in diagnostic and treatment-related errors or improved patient outcomes. In fact, recent data from an academic medical center found no relationship between prescribing errors and resident work hours. Early reports from the media and academic sources indicate that the restrictions have been difficult to implement with 92 citations for work hours violations issued to 1,753 residency programs reviewed by ACGME in the first year. Questions have also been raised regarding the potential negative impact of restrictions on the quality of GME training programs, and the continuity of patient care and safety. Raw work-hour numbers do not provide any indication of the amount of time spent in actual diagnostic and treatment decisions versus administrative tasks, the actual amount of responsibility delegated to that individual for a given treatment decision by a particular supervising physician, the degree of supervision provided while doing invasive procedures, the number of patients that the resident was responsible for at a given time, the amount of sleep that the individual got on call, or the acuity and volume of patients admitted or treated on cross-cover duties. These and other factors introduce a great deal of variability and complexity into the larger task of improving patient safety which recent legislation has attempted to address.

References
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AMERICAN ACADEMY OF DERMATOLOGY
I am a third-year premedical student at a small liberal arts college in Oregon. As part of my academic experience I was lucky enough to spend the month of January 2004 in the office of a small-town dermatologist. The same day I became Dr. Stiglmeier, I began a journal in which I recorded pertinent information about each patient I encountered, such as the reasons for their love of dolphins, how they trapped rubidium at absolute zero, and their many different uses for Bag Balm® (Dairy Association Co. Inc., Lyndonville, VT, USA). This eclectic collection of random information allowed a connection between us, a chance to live vicariously through the patients’ words, if only for a moment. I recorded other, perhaps less important, things too: the real reason they came to the clinic, my diverse feelings and moods that changed with each new patient encounter. The following is an entry from a typical day during my second week.

I’m supposed to be writing everyday about what I’m learning, what I’m experiencing, what I’m living. This week, I’ve been busy, lazy, often overwhelmed, and tired. That’s because I’ve been paying attention. I’ve been sitting with people all day long, all week. I’ve been snipping, and cutting; peering, poking, prodding, stroking, touching, consoling, soothing. And, I’ve been listening. Listening to stories told from memories ingrained in the minds of people who I may never see again. Listening to body language, to stories, worries, and concerns that aren’t told completely with words, trying to decipher reasons why their bodies are reacting to the ideas and stresses that plague their minds.

This week has proven to be a test. Could I really do this everyday? All day? For the rest of my life? Could I go to sleep at night, even if I knew I didn’t do all I could have to help someone? I know I’m not ready for it now, but I hope someday I am. Through these first two weeks, I’ve learned more than I ever imagined I would have. I’ve learned that:

• People become an open book once we find a common thread
• As people grow older, they worry more about their health and less about what others think of them
• People may appear joyful on the outside, but often harbor deep pain on the inside
• A man can be joyful even though his wife is dying
• With a hundred acres and some sheep, you learn how to farm
• A benign seborrheic keratosis isn’t as exciting as it sounds
• There are some 92-year olds who are, in a good way, “full of the devil”
• Going to the right school doesn’t necessarily make you right in the mind and heart
• It is important to give people the same attentiveness, energy, and affection, whether they have the first appointment of the day or the last
• Life is like a smorgasbord, you don’t want to get stuck on the first dish, but you can always come back to it for seconds
• It is better to create than to improvise
• Very often an unattractive exterior can distract someone from the gorgeous interior
• Touch can comfort and heal just as much, if not more, than any prescription
• People are impressed with knowledge, yes, but even more so with a genuine smile and a gentle heart
• If allowed, people will find any excuse to freak out
• There seem to be themes for each day ... I’m not especially fond of the ones like “scabies-day”
A topic that may seem trivial to you is something a person’s whole life may revolve around. It’s real to them.

Knowing how to do a 3-mm punch biopsy, to hold scissors correctly, to tie stitches, to keep gauze sterile, to do a fungal hyphae scraping, what a scabies mite really looks like, and the difference between psoriasis and eczema are also relevant to the job.

Purgatory for a dermatologist is dropping a tiny specimen on a carpeted floor.

There are no accidents, only appointments

Without patients, there is no need for doctors

Freedom from the clinic allows me to run along the quiet village roads, where this is no escape from the bitter cold. The chilling air is strangely reviving to this wahine from the Islands, and my pace automatically quickens from the thoughts flying through my head. The images and words from the day morph into poetry I repeat in my head to the rhythm of my pounding heart. At this point in my life, medicine holds the promise of Miranda:

O. Wonder!
How many goodly creatures are there here!
How beauteous mankind is! O brave new world,
That has such people in’t.

Reference:

Biography of CAITLIN ELENA STIGLMEIER

I am white. I am German, Swedish, Irish, and English. I am Hawaiian. I am Korean, Chinese, Samoan, Filipino, Tongan, and Tahitian. I am Japanese. I am Italian, French, Slovenian, and Swiss.

I am white because of my skin color. I am German, Swedish, Irish, and English because that’s the blood that flows through my veins, the genes I inherited from generations of lineage.

I am Hawaiian because that is my home. I was born on October 20, 1983 on Kauai, Hawaii and have had the astounding luck to live in the same house my whole life. I am the product of adventures through hidden valleys laden with dark, damp soil that smelled of life hidden beneath it – following no trail and leaving none behind as we weaved our way across mountains, my family and I. I am Korean, Chinese, Samoan, Filipino, Tongan, and Tahitian because of the constant influences of those cultures I received growing up. Some of you may have gone to Little League practice after school – I learned kanji, how to hula at seven, and the importance of a leash while surfing. At the age of 10, I announced that I was going to become a pediatrician. It hasn’t changed since.

I am Japanese because at 15, I “ran away from home” to what would turn out to be my second home - Moriyama, Japan. A year of my life was spent immersed in Kyoto studying the language, the many ancient art forms, imprinting the deep-rooted culture upon my heart. It was there I was enveloped into my host family’s lives, their hearts, and the many folds of their ancient kimonos. To describe how that experience changed me and what it meant to me would take volumes; some of it never be expressed with words. But it did open my eyes, as well as my heart, to all the possibilities that the world holds. It’s amazing what each corner of the world can hold in its quaint entirety.

I am Italian, French, Slovenian, and Swiss because of the opportunity I had to study there for a month through a college course. Linfield College somehow found me and now the tiny town of McMinnville, OR has the feeling of home as well. It too, after four years of late-night chemistry labs, friendships that have given new meaning to the word, 1:00 a.m. covert operations to wreak possible “legal” havoc on campus, has left an imprint on my life as well. I’ve learned that we’re never going to get less busy, so we might as well seize all opportunities now.

I am also the product of the ocean, of the many trails I have woven through mountains and valleys too numerous to mention. In the few spare moments that I do have, I try to spend outdoors. Surfing has proved to be the perfect combination of serenity and frustration, but the ocean never disappoints me. If I’m not training for the track team, the foothills of McMinnville offer a peaceful tranquility amidst the silent fog.

I am also ready. I am ready to travel to Southeast Asia in January 2005 in order to develop a better sense of the way these countries are incorporating modern healthcare into traditional practices, although I’m not sure I’m ready for the poverty and lack of care I’m bound to find there. I am ready to graduate with a degree in biology, ready to take on the demands and rewards of becoming a medical student and, someday, a doctor. Through a dermatology internship I did in January 2004, I was reminded why I wanted to be a doctor in the first place, although it might not have been clear to me when I was 10, or when I was enshrouded in chemistry assignments. Becoming a doctor is the opportunity to look at the inner workings of the body in connection with the mind and soul, the ability to literally “get under someone’s skin,” and fix the broken parts. It’s the intimate relationship that is formed between patient and doctor, the honor and respect physicians receive when they are allowed to examine a patient, both internally and externally. It’s the lessons we as health professionals learn from the patients that are equally as important as the care we provide. Someday, I’ll be ready to incorporate my love for travel and adventure with my career as a doctor, carrying Good News and healing, in their various forms, to the people of the world.

Caitlin being attentive to the last patient of the day.
Emphysematous pyelonephritis: A case report

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Introduction
Emphysematous pyelonephritis is a rare, necrotizing infection with
gas formation of the kidney that primarily affects diabetic patients
and carries a high mortality. First described in 1898, there are only
approximately 200 cases reported in the literature. Increased aware-
ness and early diagnosis may help improve outcomes.

Case Report
A 65 year-old woman was admitted for new onset diabetes with
diabetic ketoacidosis and urinary tract infection. She developed
constant, diffuse, abdominal pain, anorexia, tactile fever and chills
for 3 days. On admission, temperature was 98.7°F, pulse 113/minute,
blood pressure 168/54 mmHg, respirations 49/minute, and oxygen
saturation 98% on 5L nasal cannula. She was tachypneic with ac-
cessory muscle use, decreased breath sounds and crackles at her
left more than right lung base. Cardiac auscultation was normal.
Abdomen was distended, diffusely tender, and tympanitic to per-
cussion. She had bilateral costal-vertebral angle tenderness. Initial
labs were as follows: Sodium 123 mEq/L, Potassium 4.2 mEq/L,
chloride 89 mEq/L, bicarbonate 11 mEq/L, BUN 55 mg/dL, creati-
nine 1.9 mg/dL, glucose 591 mg/dL, WBC 15.1/cu mm with 57%
neutrophils and 32% bands, hemoglobin 14.1 g/dL, and platelets
72,000/cu mm. Urinalysis was notable for specific gravity of 1.020,
pH 50, glucose > 1000 mg/dL, ketones 15 mg/dL, protein 100 mg%,
2-5 WBC and 5-10 RBC per high power field, and many bacteria.
Abdominal radiograph showed dilated loops of bowel but no free
air. Chest radiograph revealed an elevated left hemidiaphragm that
developed into a left lower lobe consolidation the following day.
Renal ultrasound demonstrated a cyst on the right kidney, and the
left kidney was poorly visualized. Urine and blood cultures grew out
Escherichia coli. Abdominal computed tomography scan without
contrast was performed revealing gas in and around the left kidney
(Figure 1). Platelets dropped to 37,000/cu mm. Left sided nephrec-
tomy was performed and the patient recovered. Pathology revealed
severe necrotizing pyelonephritis with hemorrhage and obliteration
of the corticomedullary junction and pyramids.

Discussion
Emphysematous pyelonephritis is a necrotizing renal infection
characterized by the presence of gas within the renal parenchyma.
Reduced blood flow with thrombosis of the kidney may be the ini-
tiating event in the pathogenesis of emphysematous pyelonephritis.
Diabetes mellitus is present in 70-96% of patients. Emphysematous
pyelonephritis is 3-6 times more common in women. The left
kidney (67%) is more frequently involved and bilateral involve-
ment is seen in 12%. Factors involved in the pathogenesis of emphy-
sematous pyelonephritis include: 1) gas-forming bacteria; 2) high tissue glucose;
3) impaired tissue perfusion; 4) and a deficient immune response. A
vicious cycle ensues with increased gas production causing tis-
uue ischemia, resulting in necrotic tissue, which in turn serves as
a substrate for further bacterial proliferation and gas production.
Diabetic microangiopathy may contribute to impaired transport of
end products and accumulation of gas. In nondiabetics, lactose
may serve as a substrate for fermentation.

Infecive organisms can be identified in 92-98% of cases. Organ-
isms frequently associated with emphysematous pyelonephritis are
able of fermenting sugars. Fermentation produces carbon
dioxide and hydrogen gases as byproducts. Pathogens include
Escherichia coli (60-90%), Klebsiella pneumoniae (26-29%) and
multiple others (11%) including Proteus mirabilis or vulgaris,
Enterobacter aerogenes and Pseudomonas aeruginosa. Mixed
infections may be responsible for up to 19% of cases. Rare causes
include Streptococcus species, Clostridium septicum, candida and
renal amebiasis. Other causes of gas within the urinary tract
include recent instrumentation, fistulous connection with a hollow viscous, or penetrating trauma.6,13,15

**Clinical Presentation**

Typical clinical findings are listed in Table 1.2,9,14,16 An abdominal mass may be palpable, although crepitation is rare.13 Urinary tract obstruction may be found in 5-40%, while urinary stones are found in up to 27%.8 Up to 4% of cases of emphysematous pyelonephritis have polycystic kidney disease.7 Other risk factors are drug abuse, neurogenic bladder, alcoholism, and anatomic anomalies.17

**Diagnosis**

Due to the lack of specific findings, diagnosis is often delayed. Michaeli et al suggest obtaining a plain radiograph as part of the initial work-up of all poorly controlled diabetics presenting with presumptive urinary tract infection.1,2 A plain film detects gas in 33%-85% of cases.8,13 Gas seen in the renal parenchyma is diagnostic, but normal appearance does not rule out emphysematous pyelonephritis.14

Computed Tomography (CT scan) is the diagnostic study of choice.8 It has the highest sensitivity and is useful in demonstrating extent of disease.15 Huang et al established a classification system for emphysematous pyelonephritis that is useful in the management and prognosis of this disease (see Table 2).2

**Management**

Treatment of emphysematous pyelonephritis with antibiotics alone is inadequate. Numerous studies have demonstrated high mortality with conservative management. For class I and 2 disease, antibiotics with percutaneous drainage are extremely effective, and can be followed by nephrectomy if the patient does not improve. For classes 3A and 3B, patients are either initially managed with antibiotics and percutaneous drainage or direct nephrectomy depending on the presence of the following four risk factors: 1) thrombocytopenia, 2) acute renal impairment, 3) disturbance of consciousness, and 4) shock. 85% of patients with 1 or fewer risk factors can be successfully treated without nephrectomy. For patients with 2 or more risk factors, only 8% would be cured without nephrectomy, so prompt nephrectomy is warranted.8 For patients with class 4 disease patients are usually treated with bilateral percutaneous drainage initially to try to preserve as much renal function as possible.6 If patients do not improve they must then have nephrectomy.2

**Prognostic Features**

No significant difference between non-survivor and survivor groups was found in a retrospective study of 38 patients with respect to age, gender, diabetes mellitus history, presence of bacteremia, identity of infecting organisms, blood glucose level, leukocyte count, urinary white blood count, presence or absence of urinary tract obstruction or uro lithiasis, and modes of treatment.8 Serum creatinine is the most reliable predictor of outcome.8 Thrombocytopenia and urinary red blood cell counts are also significant predictors of outcome.9 The best predictors of mortality are creatinine> 1.4 mg/dL (sensitivity 93%, specificity 39%), creatinine > 2.5 mg/dL (sensitivity 80%, specificity 70%), platelet <60,000 x10^9/L (sensitivity 67%, specificity 87%), platelet <100,000 x10^9/L (sensitivity 80%, specificity 61%).9

Another more recent study of 48 patients found severe proteinuria (>3g/L), thrombocytopenia (<120 x 10^9/L), and disturbance of consciousness to be independent factors of poor outcome (poor outcome defined as mortality or need for nephrectomy).8

Overall mortality rate is 18-40%.2,3,9 Bilateral emphysematous pyelonephritis results in death in 47-50% of patients.1,9 Mortality of patients treated conservatively was 40-80%, 15-60% for those who received percutaneous drainage, 13% for those with initial percutaneous drainage followed by nephrectomy, and 10-30% for those with surgical management.2,5,6

Mortality by classification of Huang et al is as follows: class 1 (0%), class 2 (9%), class 3A (29%), class 3B (19%), and class 4 (50%).2 Additionally, failure of percutaneous drainage was as follows: class 1 (0%), class 2 (0%), class 3A (71%), class 3B (30%), and class 4 (75%).2

**Conclusion**

Clinical trials are lacking due to the low incidence of the disease. Clinicians must have a high index of suspicion for diabetic patients with pyelonephritis. Early imaging should be considered to avoid delays in diagnosis. Optimal management is uncertain but can begin with antibiotics and percutaneous drainage for most cases. Nephrectomy should be performed early for patients with advanced disease, patients with risk factors, or in those who initially failed conservative management options.

See “References” p. 25
On the evening of October 30, 2004, 9 inches of rain in a 6-hour period drenched upper Manoa Valley, causing a flash flood. The result was a 4-foot wall of water that slammed into the Biomedical Sciences Building, home of the John A. Burns School of Medicine. The Institute of Biogenesis and the first floor of Biomed and all of its courts sustained major hits. Water and mud flowed over lab counter and benches, into computers, books, and papers, over freezers and incubators and machinery. The auditorium (B-103) and the basement became receptacles for 5 feet of water. Another seriously affected building was Hamilton (graduate) Library. The main transformer and electrical supply cables that powered 35 buildings went out.

Most folks seem to know little of what happened. The assumption was that some stuff got wet and that it has since been cleaned up. For those who occupied these facilities, there was no time for bereavement. Because of likely health hazards such as mold blooms, instructions were compiled to vacate the building in 48 hours, without waiting for major assistance from the system resources. With Dr. Sam Shomaker’s leadership (Vice Dean for Academic Affairs and Education), staff, students, faculty, and volunteers (Army National Guard) worked feverishly in the mud and the dark (no electricity) through the first week of November to salvage as much as possible. No one complained. All worked, without breaks and often forgoing meals, to save the most important documents, files, and books.

Of great concern were the emergency needs of critical research and animal care areas. Enough power from emergency generators kept the freezer operational in the upper floors of Biomed Tower. Three thousand pounds of dry ice were distributed to preserve samples and other materials that needed to remain cold and frozen in the affected buildings. Affected library collections were placed in freezer trucks so that they could be preserved.

On the fourth day, a convocation was held in the Newman Center for a chance to share the trauma of the past few days as well as memories of the 33 year-old building that was home to so many staff, students, graduates and faculty. Those that met spoke of those ties, thanked each other; and then went back to work. For all of us in the helping professions, this is what we do to take care of each other: hold hands, thank each other for being there, and get back to the task at hand. On the fifth day, a professional catastrophe team from Texas was retained to undertake detailed clean up and to plan for limited occupancy of personnel and programs above the ground floor.

The task of finding spaces on the campus and elsewhere to relocate offices, classrooms, student records, business files, and educational material and books became a daunting task. With the cooperation of the community, temporary spaces have been acquired. JABSOM’s Office of the Dean located to the Gold Bond Building and Kuakini Medical Center; Office of Student Affairs, Native Hawai‘ian Center of Excellence and Pathology are at Queen’s Medical Center University Tower; Office of Medical Education, Imi Ho’Ola, Department of Native Hawai‘ian Health, Office of Information Technology, Department of Complementary and Alternative Medicine are at the Gold Bond Building; the Fiscal Office, the Department of Public Health, and Human Resources are at the Dole Cannery; and Ecology and Health is at Leahi Hospital. The main number to call for information is: 587-8369.

Update. On December 4, the air conditioning system in the tower portion of the Biomed Building was turned on to clean the air conditioning vents. On December 5, the professional clean up crew went through the entire tower; floor by floor, to clean and disinfect all exposed surfaces. On December 6, the chiller was turned on to restore air conditioning to the tower. On December 7, these restoration steps provided work conditions in the Biomed Tower, from the second to the seventh, for a safe environment for faculty, staff and students. It is not known, at this writing, when generator power can be provided via electrical circuits to the courtyards of the building.

For those who have relocated to all parts of Honolulu, the comment heard is, “If only the Act of God of giving us all that rain on the night of October 30, 2004, could have come in March, 2005, it would lend such a natural transition to the new JABSOM campus in Kaka‘ako.” If only...

This catastrophic flood has fueled our anticipation of moving to Kaka‘ako in April, 2005, to two new buildings totaling 300,000 square feet of floor space constructed on 9.5 acres of prime land at a cost of $150 million. We are more convinced than ever, that JABSOM’s community of faculty, staff and students are no match in working as a team. Their stamina, motivation, and resilience are beyond reproach. They will not be fazed with any challenge, even another storm like the one on October 30, 2004. They have proven themselves. The community can depend on all of us to fulfill our mission of becoming the best medical school in the world, with an Asia/Pacific focus.
Sea Turtles

Sea turtles are one of the oldest extant groups of animals, and they have changed little in basic anatomy for millions of years. Sea turtles are found throughout the world, and depending on the species, range from warm tropical water to frigid oceans near the arctic. They can be herbivores, omnivores, or carnivores and can be quite large. For example, the largest species of sea turtle, the leatherback, can weigh several hundred kilos. All sea turtles have an oceanic existence. Males spend almost their entire life in the ocean. After mating, females crawl onto nesting beaches where they dig a nest, lay eggs, and return to the ocean. Several weeks later, these eggs hatch, and baby turtles disappear out to sea (no one knows exactly where). Eventually, juvenile turtles return to foraging grounds where they eventually mature to adults. Adults then migrate, sometimes many thousands of kilometers, to their breeding and nesting grounds where the cycle begins again. Sea turtles live for many (40+ years). Of the seven species of sea turtles, all are listed as threatened or endangered by the Endangered Species Act. Major threats to sea turtles worldwide include overharvesting of meat and eggs for human consumption from nesting beaches for consumption, bycatch of sea turtles from fisheries, and disease.

Hawaii has two coastal species of sea turtles, the hawksbill (Eretmochelys imbricata) and the far more numerous green turtle (Chelonia mydas). The major nesting grounds for green turtles in Hawaii are at French Frigate Shoals in the Northwestern Hawaiian islands (~500 miles from Oahu); the main Hawaiian islands harbor the foraging pastures where you can see juvenile and adult green turtles grazing on marine algae. Since green turtles were listed as protected, the numbers of adults on nesting beaches has increased steadily.

Fibropapillomatosis in Sea Turtles

A few cases of cancer have been reported in sea turtles including a leiomyoma in a green turtle from Florida and lymphoma and squamous cell carcinoma in loggerhead turtles from Spain. However, by far the most important disease of sea turtles is fibropapillomatosis (FP). FP was first documented in green turtles from Florida. Since then, it has been found in many species of sea turtles worldwide, including mainly green, loggerhead (Caretta caretta), and olive ridley (Lepidochelys olivacea) turtles. In Hawaii, FP is believed to have been present since the 1950s. FP is unusual among neoplastic diseases of free-ranging wildlife in that it affects a significant percentage of animals. For example, in Hawaii, depending on method of collection and location, prevalence of FP in Hawaiian green turtles can range from 20-60%.

The most visible manifestation of FP in green turtles is the presence of large tumors on the skin, eyes, and corners of the mouth. In some instance, these tumors can become very large and occlude vision. About 25% of turtles with FP also have internal tumors, most commonly in the lungs, heart, and kidney. On histology, these tumors are universally composed of a connective tissue matrix and fibroblasts. In the case of skin tumors, these have been characterized as fibropapillomas while tumors in internal organs have been classified as fibromas, myxofibromas, or fibrosarcomas of low-grade malignancy. Hawaiian green turtles also have tumors in the glottis, and as expected, such animals are prone to getting pneumonia and other respiratory inflammatory problems. Interestingly, green turtles with FP from Florida do not get tumors in the glottis. Green turtles afflicted with FP can be found on all major foraging pastures of the Hawaiian Islands, however, the disease is rare on the west coast of the island of Hawaii, and reasons for this are unknown.

In Hawaii, FP is the most significant cause of stranding morbidity and mortality in green turtles. More troubling is that the prevalence of disease in juvenile turtles far exceeds that found in adults, and given that juveniles are an important life stage for long-lived species like sea turtles, the disease may have demographic effects in the longer term. A system to score severity of FP in green turtles based on size, number, and location of tumors was developed in Hawaii. Green turtles with moderate to severe FP are over-represented on strandings and are less likely to be recaptured. Green turtles with moderate to severe FP are also lymphopenic, suffer from chronic inflammation, are immunosuppressed, and are prone to systemic bacterial infections. All this indicates that FP is more than a mere cosmetic disease and has detrimental impacts on the survival of affected animals. Cases of FP regressing are uncommon. To top it all off, 100% of turtles that strand with FP have concomitant infections with blood flukes that resemble the human disease Schistosomiasis.
Many causes for FP have been proposed including pollutants, blood flukes, marinetoxins, ultraviolet light, and viruses. Tantalizing evidence of viruses was found during microscopic examination of skin tumor from Floridian green turtles that revealed intranuclear inclusions compatible with herpes viruses. Follow-up studies in Florida revealed that FP could be reproduced in captive green turtles using cell-free tumor homogenates thus ruling out parasites and further implicating a filterable agent such as a virus as a possible cause. Other potential viral etiologies such as retroviruses and papilloma viruses were thought to play a role. However, more recent evidence from Hawaii and Florida implicates an alpha herpes virus as closely associated with FP. Using polymerase chain reaction, DNA from an alpha herpes virus has been consistently associated with tumored tissue from green, loggerhead, and olive ridleys from Florida, Hawaii, Australia, and Costa Rica. Whether this herpes virus is the cause of FP or just happens to be found associated with tumored tissue remains unknown. A big stumbling block in progress with FP has been the inability to culture the virus in the laboratory in spite of the availability of cell culture systems. This has hampered both the confirmation of the virus as cause of disease and the development of diagnostic tests. Nevertheless, in spite of these barriers, some progress has been made simply by the ability to detect viral genome in tissues through molecular tools. Viral RNA (suggestive of active replication) is more abundant near the surface of tumors suggesting that direct contact transmission of the virus is likely. Other possible routes of transmission include cleaner fish and parasitic leeches.

Implications for Humans
The study of wildlife diseases for that matter goes beyond mere academic interest. Although FP is not zoonotic, the presence of epizootic disease in an ecosystem suggests an ecological imbalance. Given that most of Hawaii’s human population lives near or depends on the ocean, presence of disease in marine ecosystems could indicate threats to the environment that may directly or indirectly also affect humans. Understanding the dynamics and causes of wildlife disease may have ramifications for human health. In addition, few animal models exist for herpes virus-induced neoplastic diseases. Two examples are Marek’s disease, an alphaherpes virus that causes lymphomas in chickens and FP. Examples of herpes-induced viral cancers in humans include Kaposis’s sarcoma (human herpes virus 8). Kaposis’s sarcoma in some ways closely resembles FP in that it is a skin tumor that, for many years, was associated with a non-cultivable herpes virus. Understanding the epizootiology and pathophysiology of FP in sea turtles may provide valuable clues to the biology of some human cancers.

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References
References

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Creativity Is The Act Of Adding Two Plus Two To Make Five.

It's a long way to the eye clinic, but truly exciting research by Martin Friedlander, MD, PhD and associates at Scripps in La Jolla, California, was published in the Journal of Clinical Investigation. Using mouse models with a disorder that resembles retinitis pigmentosa, researchers showed that stem cells injected into the eye prevented blood vessels from degenerating and protected retinal neuronal tissue. The stem cells do not form rods or cones, but are incorporated in and around retinal blood vessels, and have a sight preserving effect. Whether or not human eyes will respond similarly is not known, but the research offers the possibility that with early identification and use of stem cells, macular and other degenerative retinal conditions may be brought under control.

Government Is Like A Baby - Big Appetite On One End, No Responsibility At The Other.

In California, a law was passed called “play or pay” whereby employers with 20 or more employees must provide health insurance for their workers, or pay into a state fund that would manage workers’ healthcare. The California Chamber of Commerce led a business coalition in gathering enough signatures to place a referendum on the November ballot to repeal the mandate. A trial judge threw out the petition, but the appellate court reversed his decision and the issue is back. Of course, in Hawaii, with no allowance for referendum, our socialist legislature forced a similar law on employers 30 years ago. However, California is a bellwether state, and what happens there is certain to be looked at by other legislatures. One of the powerful supporters of the bill is Jack Lewin, M.D., CEO of the California Medical Association. After his medical life in Hawaii, first as a family practitioner and later as state health director, he can speak from an experienced perspective.

We Need Corporal Punishment In Our Courts. We'll Use It On The Juries.

In Utah, the Supreme Court struck a landmark blow upholding the constitutionality of a cap on non-economic damages. The jury awarded $1,250,000 in non-economic damages, but the Supreme Court reduced that figure to $250,000 in accordance with the statute imposed by the Utah legislature. No one pretends that a cap will control all the problems with medical liability, but it is an important piece in stabilizing the skyrocketing malpractice premiums. The American Medical Association has made tort reform a prime area of advocacy in Congress. Will tort reform with a $250,000 cap come to Hawaii? The Hawaii Medical Association, the Hawaii Health Systems Corporation, the Hawaii Hospital Association, and many business interests are working together to achieve that end. The issue is critical because patient access is becoming problematic, as some physicians have withdrawn services, some have retired pre-maturely, and some have left the state.

Fresh Kill For Hungry Legal Vultures.

Merck removed its big time pain medicine Vioxx from the market by “putting patient safety first.” They claimed that studies linking the drug to heart attacks and stroke were “unexpected.” What baloney! Internal memos and e-mails in the late 1990s recorded that Merck’s own research showed that the drug had a greater cardiac risk than cheaper pain medications that reduced the risk of heart attack. Merck’s research chief, Edward Skolnick, acknowledged to colleagues that the cardiovascular events were real, and called it “a shame.” But, then the marketing people took over. They produced spin material and company documents that instructed representatives to dodge when responding to tough questions about Vioxx. In August of this year, a Food and Drug Administration drug safety office report showed that Vioxx correlated with a tripled risk of heart attack and sudden death when compared to people not taking the drug. Merck’s wall of denial collapsed and the drug was withdrawn. “Unexpected” and “patient safety.” Yo’ Momma! In the matter of absent ethics or conscience, the drug industry has surpassed the tobacco industry.

A Woman With A Future, Teams With A Man With A Past.

When the telephone call came, Dr. Linda Buck, a professor at the Fred Hutchinson Cancer Research Center in Seattle, was so shocked she thought it was a gag that she and Dr. Richard Axel of Columbia University were awarded the Nobel prize in physiology or medicine. No joke! Their outstanding work in understanding how animals smell revealed that human beings are able to sense and recall more than 10,000 different smells. Their research demonstrated a large family of molecular receptors in the nose which bind to chemicals in the air to produce the sensation of smell. Over thousands of years, smell has become less important to humans, yet our olfactory sense allows differentiation of thousands of different substances from chlorine to clam dip. For Dr. Axel the $1.37 million award is a cap on an inventive scientific career which has proved lucrative for Columbia University. He observed that this work could lead to insight into how smells “lead to thoughts and behavior.”

General Mills Should Be Court Martialed.

Paul Hamm is the American gymnastics star who made a brilliant high bar comeback performance to be awarded a gold medal at the Athens Olympics. Later, judges found that they had erred, that the athlete with the best overall score was a south Korean, and Mr. Hamm should have received a silver medal. The Korean team did not file a protest in the required team period, and Paul Hamm kept the gold. Subsequently, after much fuss and feathers, Olympic officials decided that Paul Hamm should not be penalized because the judges failed to score properly, and that his gold medal is official and legal. But not according to General Mills! The makers of Wheaties breakfast of champions, will not place Paul Hamm’s face on their cereal box, as they did with other Olympic champions, Carly Patterson, Justin Gatlin, and Michael Phelps (recently arrested for DUI and underage drinking—now there’s a poster boy!). Of course, General Mills can decorate their cereal with whomever they choose, but makes you wonder if these mini-minded people are from France where judges are notorious.

Saint Francis Is Having An Out Of Money Experience.

The suits with the briefcases and the Sisters of the Third Franciscan Order are shuffling papers and information attempting to see if St. Francis Healthcare System can merge with Hawaii Pacific Health (Kapiolani Health, Straub Clinic & Hospital and Wilcox Health on Kauai). St. Francis is struggling financially, and is looking to follow the wave of mainland health care facilities which are collaborating and consolidating. David Sakamoto, MD, director of State Health Planning and Development Agency (SHPDA), who must ultimately rule on the merger, gives the plan only even money.

The Air Currents Of Knowledge Never Ventilated His Mind.

Two girls in Gilbert, Arizona were decorating the hall for a school dance. While filling balloons with the inert gas helium, they decided to inhale a mouthful to make themselves “talk funny.” The school principal suspended the girls for five days for violating the school district’s policy which prohibits “the non-medical use of drugs.” The father of one of the girls was angry, challenged the principal, and accused him of going overboard with the zero tolerance policy. The principal relented and reduced the suspension to one day. We need zero tolerance of morons who can’t tell an inert substance from a drug.

ADDENDA

- A Turkish gas station attendant lost his cell phone. When he dialed the phone number, he was surprised to hear the ring coming from his dog’s stomach.
- Congress should be outsourced to India. We could save a lot of money, and get a lot more done.
- Larry Hagman (Dallas, I Dream of Genie) says he wants his body ground up in a wood chopper and scattered in a field where wheat is to be harvested for a cake to be eaten by his friends and family one year later. What a guy! That’s Larry all over.

Aloha and keep the faith —rtsS
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