ASCLS 2005 Annual Meeting: Official Abstracts of Submitted Papers and Posters

ORLANDO, FLORIDA

The following abstracts have been accepted for presentation at the 2005 American Society for Clinical Laboratory Science (ASCLS) Annual Meeting and Clinical Laboratory Exposition to be held July 26 through July 30, 2005 in Orlando, FL. The preliminary meeting program was published in the Spring 2005 issue of *Clin Lab Sci.* Abstracts are reviewed by appropriate representatives of the ASCLS Scientific Assembly Sections. They are the final authority in selecting or rejecting an abstract.

Papers and posters will be presented during the following times at the annual meeting. Room assignments will be listed in the final program.

POSTER PRESENTATIONS

Convention Center
Tuesday and Wednesday, July 26 and 27, 2005, 10:00 A.M. – 4:30 P.M.
Thursday, July 28, 2005, 10:00 A.M. – 12:30 P.M.

Authors will be present Wednesday, July 27, 2005 from 1:00 P.M. until 2:00 P.M. to discuss their posters.

CASE STUDY PRESENTATIONS

Hilton in Walt Disney World Resort
Friday, July 29, 2005, 9:00 A.M. – 10:30 A.M.

RESEARCH PAPER PRESENTATIONS

Convention Center
Wednesday, July 27, 2005, 2:00 P.M. – 3:30 P.M.

The peer-reviewed Clinical Practice Section seeks to publish case studies, reports, and articles that are immediately useful, are of a practical nature, or contain information that could lead to improvement in the quality of the clinical laboratory's contribution to patient care, including brief reviews of books, computer programs, audiovisual materials, or other materials of interest to readers. Direct all inquiries to Bernadette Rodak MS CLS(NCA), Clin Lab Sci Clinical Practice Editor, Clinical Laboratory Science Program, Indiana University, Fesler 409, 1120 South Avenue, Indianapolis IN 46202-5113. brodak@iupui.edu.

POSTER PRESENTATIONS

Effect of Pre-analytical Variables on the anti-Xa Chromogenic Assay when Monitoring Heparin Anticoagulation

David L McGlasson MS, 59th Clinical Research Squadron, Wilford Hall Medical Center, Lackland AFB TX; *Daniel A Kaczor,* Technical Services, Diagnostica-Stago Inc, Parsippany NJ; *Richard A Krasuski MD, Charles L Campbell MD, Maria R Kostur MD, Joseph T Adinaro MD,* Cardiology, Wilford Hall Medical Center, Lackland AFB TX.

The purpose of this study was to determine if the chromogenic anti-Xa assay is less affected by pre-analytical variables in monitoring patients on unfractionated heparin (UFH) and low molecular weight heparin (LMWH) than the activated partial thromboplastin time (APTT). Forty-six subjects receiving enoxaparin (LMWH) or UFH were randomly selected. Each study subject had six Vacutainer tubes (3.8% sodium citrate, 3.2% sodium citrate, CTAD) drawn by an atraumatic venipuncture. One tube from each set had a blood to anticoagulant ratio of 9:1. The other tube had an intentional 'short-draw' of approximately 6:1 blood to anticoagulant ratio. All specimens had an APTT and an anti-Xa assay performed on each specimen regardless of heparin type. The APTT assay mean with the 3.8% sodium citrate short draw-tube was statistically different from the other APTT assays ($p = 0.06$). However, none of the mean anti-Xa values for the UFH and LMWH heparin subjects were statistically or clinically different (ANOVA $p = 0.9878$ for UFH and LMWH $p = 0.9100$). The intentional short draw-tube did not affect the anti-Xa assay regardless of the anticoagulant. The anti-Xa assay appears to be a better method for monitoring heparin subjects than the APTT due to the lack of effect of pre-analytical variables.

In Vitro Effects of Chloramine-T on Select Wound Pathogens

Linda J Laatsch PhD MT(ASCP)SM, *Phyllis A Kirchner MT(ASCP)SH, Christopher J Anderson, Student,* Department of Clinical Laboratory Science; *Luther C Kloth MS PT CWS FAPTA, Joseph Berman MHS PT ATC,* Department of Physical Therapy; Marquette University, Milwaukee WI.

Hydrotherapy promotes wound cleansing and healing, however there is risk of exposure to pathogenic bacteria from contaminated whirlpool water. Chloramine-T (Chlorazene®) is an antiseptic powder that slowly releases chlorine into the water. The purpose of this project was to study the in vitro effects of Chloramine-T on common wound pathogens: *Escherichia coli*, *Staphylococcus aureus*, Methicillin-resistant *Staphylococcus aureus*, *Pseudomonas aeruginosa*, and Vancomycin-resistant *Enterococcus faecalis*. Standardized bacterial suspensions were exposed for 5, 10, 15, and 20 minutes to three concentrations of Chloramine-T (200, 300, and 400 ppm) at three temperatures (36 °C, 38 °C, and 40 °C). Post-exposure, the antiseptic was neutralized with 0.01% sodium thiosulfate. Samples from the mixtures were transferred by calibrated loop to tryptic soy broth and agar; cultures were incubated at 37 °C for 18 to 24 hours, and observed for growth. For all tested bacteria, except *Pseudomonas aeruginosa*, there was typically ≥99% reduction in growth, regardless of Chloramine-T concentration, temperature, or time. Because protein at the wound site is known to inhibit some germicides, these experiments were repeated with 5% fetal bovine serum added. Results showed that the action of Chloramine-T was not affected by the added protein. This study suggests that Chloramine-T can be used as an effective germicide in hydrotherapy baths.

Misidentification of Calcium Oxalate Monohydrate Crystals

Jennifer Cooper CLS(NCA), *Jo Ann Wilson PhD CLDir(NCA)*, Florida Gulf Coast University, Fort Myers FL.

Blood and urine specimens from a 39-year-old unconscious male with no known history were received from the ED. The urinalysis report included uric acid or possible hippuric acid crystals. The attending physician called the laboratory requesting that the crystals be re-evaluated. Urinary sediment was tested with dilute hydrochloric acid and the crystals dissolved. This confirmed the presence of calcium oxalate monohydrate as uric acid or hippurate will not dissolve and the report was changed. The diagnosis of ethylene glycol (EG) poisoning was made and confirmed with the results of an EG of 174.9 g/mL, reference range 10 g/mL, and increases in the anion gap and serum osmolarity. Early diagnosis by crystalluria permitted treatment to begin in a critical timeframe and the patient responded favorably. Acute EG intoxication is a medical emergency that, if not diagnosed correctly and aggressively, will lead to serious neurologic, cardiopulmonary, and renal dysfunction, and may result in death. The needle-like appearance of the monohydrate form is often misinterpreted as uric acid or hippuric acid crystals by an untrained laboratorian. The detection of calcium oxalate monohydrate crystals associated with EG poisoning is key for diagnosis confirmation as it indicates that EG has been metabolized.

Prospective Students' Preparation for a CLS Program

Leonce H Thierry Jr MS MT(ASCP), University of Texas Medical Branch, Galveston, TX.

The purpose of this study was to evaluate prospective students' preparation for clinical laboratory science (CLS) programs. A health professions survey assessed perceptions of course preparation, matriculation, and future plans in CLS. Forty-five students from two-year and four-year colleges were examined. Data indicated a significant difference in CLS preparation from students who attended colleges that have a health professions advising office (p <0.05). These students received advice on what courses to take along with academic counseling towards the profession. Students from colleges that did not have a health professions advising office rarely or never received academic advising on CLS. The survey suggested that these prospective students were most likely to self-advise or rely upon Websites as the primary source for information about CLS programs. The investigator concluded that CLS recruiters and faculty members should work closely with health professions counselors in efforts to increase awareness of CLS. There was no significant difference in preparation from students who attended historically Black colleges and universities (HBCU) and Latino serving institutions from majority two-year and four-year colleges. Further surveys will be analyzed through the summer of 2005.

Utility of Lecithin Cholesterol Acyl Transferase Mass as a Diagnostic Marker for Liver Disease and Liver Transplant

Karen R Murray PhD CLS(NCA), Tarleton State University, Stephenville TX.

The purpose of this study was to determine the utility of serum mass levels of lecithin cholesterol acyl transferase (LCAT), as a diagnostic marker for liver disease and liver

transplant. Studies conducted over 20 years ago supported LCAT enzyme activity levels as an excellent marker for liver disease and evaluating the success of liver transplant. LCAT activity levels however proved not to be valuable clinically as the assays were difficult to standardize, lacked a defined substrate, and were tedious to perform. Recently an enzyme linked immunoassay (ELISA) using two monoclonal antibodies has become available to measure LCAT mass, and overcomes the measurement problems associated with the activity assay. Forty samples with normal liver function were run to establish a reference interval (9.3 to 14.1 µg/mL). LCAT mass was then determined on 45 samples with varying degrees of liver disease, and paired pre and post liver transplant samples were run. Results showed a significant difference between the values obtained from normal samples and those with severe liver disease (0.8 to 4.6 µg/mL). In addition, a rapid recovery in LCAT mass was noted between pre and post transplant assays. These results support the value of LCAT mass as a diagnostic marker for liver disease and liver transplant.

CASE STUDY PRESENTATIONS

Heparin Induced Thrombocytopenia

Catherine E Newkirk MS MT(ASCP), Marist College, Poughkeepsie NY.

A 70-year-old male severed his hand requiring amputation of his thumb. Two weeks later, pain in his leg caused hospital admission. An angiogram revealed occlusion of the proximal left femoral artery requiring embolectomy and subsequent amputation of the left leg. His platelet count dropped (105,000/µL to 32,000/µL). He received continued heparin and platelet transfusions. The next day, he developed diaphoresis with chest pain and shortness of breath. The following day he developed slurred speech and weakness of his left extremities. A CAT scan demonstrated right cerebrovascular accident without hemorrhage. Electrocardiogram showed acute myocardial infarction. A diagnosis of heparin induced thrombocytopenia (HIT) was entertained. Hirudin was transfused. He deteriorated and died the next day. Cause of death was HIT secondary to heparin therapy with multiple thromboses of his right internal carotid artery, right middle cerebral artery, left anterior descending coronary artery, and thrombophlebitis of the deep venous system of his left leg. Platelet factor 4 binds to heparin and antibodies are produced to this complex. The complex attaches to the platelet, activating it and the clotting system, causing thrombosis and thrombocytopenia. This occurs in 1% to 3% of patients receiving heparin and warrants monitoring patients on heparin therapy with daily platelet counts.

An Unusual Presentation of Disseminated Histoplasmosis

Linda A Smith PhD CLS(NCA), University of Texas Health Science Center, San Antonio TX.

Histoplasmosis is endemic in much of the central United States, especially along the Ohio, Missouri, and Mississippi River valleys. Infection occurs after inhalation of infective conidia from soil contaminated with bird or bat droppings. The disease has several clinical presentations. In the majority of individuals, infection is either asymptomatic or presents as a self-limiting, non-specific respiratory illness. A few persons develop acute infection with fever, chest pain, and non-productive cough. Immunocompromised patients are at highest risk to develop disseminated infection involving the reticuloendothelial system, skin, oral cavity, and/or gastrointestinal tract. This case is that of an HIV positive, 33-year-old African-American male who presented to his physician with a low-grade fever and abdominal pain and swelling. He had lesions characteristic of Kaposi's sarcoma on his extremities and a possible cytomegalovirus retinitis. His hemoglobin was 6 gm/dL and his erythrocyte count, white cell count, and platelet count were extremely decreased. The patient underwent an abdominal tap and bone marrow biopsy. *Histoplasma capsulatum* grew from cultures of both the peritoneal fluid and the bone marrow. The patient was treated with standard therapy for disseminated histoplasmosis but died several weeks later.

ORAL RESEARCH PRESENTATIONS

Estimated Incidence of Sickle Cell Anemia, Human Immunodeficiency Virus, Hepatitis B, and Hepatitis C in Northern Haiti

Tim R Randolph MS CLS(NCA), Saint Louis University, St Louis MO.

The purpose of this study is to estimate the incidence of sickle cell anemia, HIV, and hepatitis infections in Northern Haiti. The medical literature is nearly devoid of data from Haiti and incidence rates are essential to guide clinical practice. Based on African origin and unprotected sexual practices, clinically significant incidence rates are anticipated and therapeutic interventions are rarely available. Sickle cell testing was performed using hemoglobin solubility methods. HIV and hepatitis B and C testing were performed using immunochromatographic methods. Cultural influences and research personnel safety

issues precluded random sampling; therefore, prenatal patients, their companions, clinic staff, and other volunteers were screened for these disorders to approximate a random sample. Sickle cell and HIV testing occurred from 2002 – 2004 during annual medical mission trips and involved 180 and 185 patients, respectively. The estimated incidence of sickle cell anemia was 21.7% with a range of 14.8% to 26%, while HIV occurred at a rate of approximately 7.6% with a range of 3.4% to 16%. Hepatitis B and C were only tested in 2004 with estimated incidence rates of 78% (N = 49) and 2% (N = 54), respectively. These incidence rates justify continuing routine testing and suggest the need for therapeutic interventions.

Graduate Majors of University-based Clinical Laboratory Science Faculty

Richard Bamberg PhD CLDir(NCA), East Carolina University, Greenville NC.

As regional accrediting agencies are questioning the "credibility" of CLS/MT faculty who do not hold a doctorate with a major "in the teaching field", i.e., specifically CLS or MT major, for being able to teach in university-based, BS programs in CLS/MT, an e-survey was sent to the 110 NAACLS-accredited programs of this type in the U.S. in May 2003. The following information was obtained on 288 faculty teaching in 52 CLS/MT programs: (1) highest degree held; (2) graduate degrees held by title and major, (3) specialist certifications held; and (4) course(s)/area(s) of the curriculum taught. For the 217 full-time and 71 part-time faculty reported, 43% held a doctorate as the highest degree, 46% a master's, and 11% a BS. Only 13% of the faculty held a master's degree with major specifically in CLS or MT, while none held a doctorate in CLS or MT. Detailed results on the specific graduate majors held by the CLS/MT faculty is provided in total and in relation to the courses taught. This information may be useful to academic programs having to provide to regional accrediting agencies, justification of the "alternate qualifications" of faculty teaching in CLS/MT programs.

Monitoring Unfractionated Heparin and Low Molecular Weight Heparin Anticoagulation with an anti-Xa Chromogenic Assay using a Single Calibration Curve

David L McGlasson MS, Wilford Hall Medical Center, Lackland AFB TX.

The purpose of this study was to determine if a single calibration HYBRID curve could be used to perform the chromogenic anti-Xa assay in monitoring patients on unfractionated heparin (UFH) and low molecular weight heparin (LMWH). Forty-six subjects receiving enoxaparin (LMWH) or UFH were randomly selected. Each study subject had six Vacutainer tubes (3.8% sodium citrate, 3.2% sodium citrate, CTAD) drawn by an atraumatic venipuncture. One tube from each set had a blood to anticoagulant ratio of 9:1. The other tube had an intentional 'short-draw' of approximately 6:1 blood to anticoagulant ratio. All specimens had a chromogenic anti-Xa assay performed on each specimen. HYBRID curve values were compared with each UFH and LMWH result. None of the mean anti-Xa assays for the UFH and LMWH heparin subjects were statistically or clinically different (ANOVA p = 0.9878 for UFH and LMWH p = 0.9100). The HYBRID curve compared to UFH had a p = $v$alue of 0.9956. The LMWH subject results ANOVA compared favorably at p = 0.9512. The HYBRID curve LMWH ANOVA results had a p = value of 0.9379. The anti-FXa results for the UFH and LMWH compared favorably with the HYBRID values. The results indicate the laboratory can use a single curve to monitor UFH and LMWH.

Retention of Laboratory Personnel: Views from the Practice Field

Susan Beck PhD CLS(NCA), The University of North Carolina at Chapel Hill, Chapel Hill NC; *Kathy Doig PhD CLS(NCA) CLSp(H)*, Michigan State University, E Lansing MI.

This study was conducted to identify factors contributing to the retention of laboratory personnel from the perspectives of laboratory managers and practitioners. A nation-wide survey was sent to a random sample of laboratory managers in March of 2003. Managers were asked to give the survey to five laboratory practitioners who had worked for five or more years (committed practitioners). Surveys were received from 190 (24%) of laboratory managers and 599 (20%) of potential practitioners. All ASCLS Regions were represented. Committed practitioners who were most satisfied with their jobs believed that they make a good salary (p = .000), have work independence (p = .000), and their work is appreciated (p = .000). Committed practitioners believe that salaries comparable to nurses and appreciation from hospital administrators, nurses, and physicians would improve retention. Laboratory managers agreed that salary was the most important retention factor. Managers reported that in a five year period (1998-2002), 5% of employees left their jobs annually. Over 60% of the laboratory employees who left, did so in the first five years of practice. The top five reasons that employees left their jobs were 1) new laboratory job, 2) moved/family obligations, 3) retirement, 4) left the field entirely, and 5) employee was fired.

Towards Transnational Competence — Globalization in the Training of Clinical Laboratory Scientists through the Transatlantic Health Science Consortium

Vincent S Gallicchio PhD MT(ASCP) CLS(NCA), University of Kentucky, Lexington KY; *Ellen Hope-Kearns PhD SH(ASCP)H*, California State University, Dominguez Hills, Carson CA; *Lou Loescher-Junge MS*, University of Kansas, Kansas City KS; *Barbara Segarra MS MT(ASCP)*, University of Puerto Rico, Medical Sciences Campus, San Juan PR; *Victor Skrinska PhD DABCC,* University of Alabama-Birmingham, Birmingham AL.

Over the past decade there has been a rethinking of the importance of international education. Students having opportunities to study-abroad will have advantages in career opportunities compared to their domestic counterparts because the international experience provides 'added value' to the standard curriculum. To demonstrate that an international experience will improve cultural and work competence, the Transatlantic Health Science Consortium (THSC) was formed in 2003. It consists of four American universities: Kentucky, Alabama, Kansas, and Puerto Rico, linked to four European institutions. Its mission is to facilitate international exchanges of clinical laboratory science (CLS) students, thus providing opportunities for students to earn academic credit and gain practicum experience at the foreign site, in addition to learning how the CLS profession is practiced in another healthcare system. This paper reports on the progress made to date on how CLS/biomedical science students have performed in terms of their academics and practicum components of the program. The goal of the THSC is to provide opportunities for American students to study CLS in a comparable European program, and vice versa, as if they would in their home institution. This program may serve as a model for the globalization of the biomedical workforce of the future.

CORRECTION

"Advances in Understanding the Biology and Genetics of Acute Myelocytic Leukemia" and "Chronic Myelocytic Leukemia-Part I: History, Clinical Presentation, and Molecular Biology"

Dear *Clin Lab Sci* Editor,

It has come to our attention that an error was identified in each of two articles published in the Winter 2005 issue of *Clin Lab Sci* (Volume 18/Number 1). The first error was in the article titled, "Advances in Understanding the Biology and Genetics of Acute Myelocytic Leukemia". On page 32 under the Class II Mutations section, the locations of the AML1 and ETO genes were transposed. The erroneous sentence reads, "In t(8;21), one of the most frequent genetic mutations in AML, the AML1 gene on chromosome 8 is fused to the ETO gene (also called MTG8 or CBF2T1) on chromosome 21". In fact, the AML gene is found on chromosome 21 and the ETO gene is found on chromosome 8.

The second error appears in the article titled "Chronic Myelocytic Leukemia-Part I: History, Clinical Presentation, and Molecular Biology". On page 38 in the data synthesis section of the abstract on lines 12 and 13, the locations of the BCR and ABL genes were transposed. The two lines read, "…involving the BCR gene from chromosome 9 and the ABL protooncogene from chromosome 22." The phrase should read, "…involving the BCR gene from chromosome 22 and the ABL protooncogene from chromosome 9." The remainder of the article consistently cites the correct locations of the BCR and ABL genes.

We apologize for these unfortunate and regrettable oversights.

Shirlyn B McKenzie PhD CLS(NCA)
Tim R Randolph MS CLS(NCA)