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- Preface -

It is my pleasure to welcome you to Arrowhead Regional Medical Center's Third Annual Research Day. My thanks to each one whose research and commitment is illustrated in these Proceedings. It is my sincere hope that the submissions from today may go on to help shape and focus future developments in medical care.

I encourage you to read through the Proceedings and engage the various authors in discussion. Perhaps some of the articles will provide inspiration for further studies and projects. A special thanks, again, to Dr. Edward Lee who has perpetually lent his expertise and enthusiasm to make this event a reality for the past three years. I am also grateful to the ARMC Foundation for their financial support of this year's endeavor. As we launch our third year of showcasing the research done here at ARMC by our residents, I salute the dedication and diligence exemplified by those whose work is demonstrated on the following pages.

David Lanum, M.D.
Editor

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DELIVERY OUTCOME WHEN ESTIMATED FETAL WEIGHT OF > 4000G AND COMPARISON WITH DELIVERIES COMPLICATED BY SHOULDER DYSTOCIA

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Objective: We decided to compare the characteristics of deliveries in which the estimated fetal weight was known before delivery versus deliveries in patients that suffered shoulder dystocia at the time of delivery.

Material and Methods. We reviewed medical records of all patients delivered in a 10 months period. All reported cases of shoulder dystocia in four years were reviewed retrospectively for comparison.

Results. 212 of 2442 deliveries (8.68%) patients received ultrasound with EFW within 1 week of delivery. Forty-one patients were found to have EFW >4000, and all were offered delivery by cesarean section. Nine patients went through trial of labor, and five (55.6%) failed. Analysis of data showed EFW vs. actual birth weight > 4000g has sensitivity of 65.6%, specificity of 89%, positive predictive value of 51%, and negative predictive value of 94.15%. If the threshold of detection is changed to 4500g, the sensitivity becomes 43%, specificity 97%, positive predictive value 33%, and negative predictive value 98%. Of total of 12,965 deliveries documented over a period of 4 years, there were 58 cases (0.45% National average is 0.5~1.5%) shoulder dystocia reported, with associated 7 cases (0.054%) of clavicular fracture and 6 cases (0.05%) brachial plexus injury. Of the 58 cases of shoulder dystocia only 7 (12.1%) received ultrasound with EFW within 1 week before birth, despite some of them being diabetics.

Conclusions. In patients that had an EFW > 4,000 g and chose to have a trial of labor, none suffered shoulder dystocia. The majority of patients with shoulder dystocia had not an US-EFW. We think that the knowledge of a large baby entering labor influenced decision making process by which many of those who tried labor, had a cesarean section for failure to progress. We changed our policy to include an estimation of fetal weight in all patient with diabetes mellitus and anyone with large fundal height (regardless of maternal weight).

A CASE REPORT AND REVIEW OF CARDIAC MANIFESTATIONS OF CHAGAS' DISEASE AFFECTING A HISPANIC MALE

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Chagas' Disease (CD) is a vector borne illness caused by the parasite *Trypanosoma cruzi* (T.cruzi), and can manifest as both acute and chronic illness. CD has been a significant health concern in South and Central American countries, affecting 10 – 12 million people worldwide. In the chronic phase, morbidity and mortality is high from complications of cardiomyopathy such as heart failure, arrhythmias, and thromboembolism. In United States, CD remains an exotic infectious disease, which can remain undiagnosed for many years. However, increase in Latin American population over the recent decades requires physicians to be aware of the clinical features of this important infection.

In this report, we describe the case of a 43-year-old Hispanic male with history of multiple ischemic strokes and right bundle branch block, who presented with sudden cardiac arrest due to pulseless ventricular tachycardia. Further diagnostic testing revealed a characteristic dilated left ventricle with poor systolic function and an apical aneurysm on coronary angiography. Serologic evaluation confirmed the presence of anti *Trypanosoma cruzi* antibody.

This report calls for further epidemiological research of Chagas' heart disease and its prevalence in Northern America.

PREVALENCE OF METH-AMPHETAMINE INDUCED CARDIOMYOPATHY

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Introduction: It is well known that there is high prevalence of methamphetamine abuse in San Bernardino County. Chronic methamphetamine use can induce dilated cardiomyopathy. There have been no studies that we could find looking at extent and prevalence of cardiomyopathy in this group of patients. We hypothesize that there is a significantly higher prevalence of cardiomyopathy in chronic methamphetamine abusers leading to heart failure contributing to increased morbidity and mortality in this group of patients.

Methods: This study is a retrospective review of methamphetamine abusers younger than 50 years old who were admitted to Arrowhead Regional Medical Center between June 2005 and December 2006. The echocardiogram results were compared to a control group during the same time period. The 2 groups were matched for other cardiac risk factors such as diabetes, hypertension, and renal failure. Data was obtained through chart review, echocardiogram logs, and computer records.

Results: Total of 210 patients was chosen for analysis. The average cardiac ejection fraction (EF) among methamphetamine abusers and control group was 45% and 55% respectively. Furthermore, methamphetamine abusers older than 35 years old were more likely to have EF of less than 40% than those younger than 35 years old (29% vs. 14% respectively).

Conclusion: The results of this study support our hypothesis that patients with methamphetamine abuse have lower ejection fractions and significantly higher rates of cardiomyopathy compared to the general population. Older methamphetamine abusers were more likely to have severe dilated cardiomyopathy. Further prospective data is needed to better understand the pathophysiology and treatment of methamphetamine induced cardiomyopathy.

WOUND CARE MANAGEMENT IN A PRIMARY CARE SETTING

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An overall assessment, analysis, and summary of the literature pertaining to wound care and management was performed and reported in a concise, organized, and educational format. The details were arranged to pertain to a primary care setting.

Wound healing has been described by Sussman et al. as, "a cascade of overlapping series of events that occurs in a reasonably predictable fashion." These events can be classified into phases; inflammation, epithelialization, proliferation, remodeling. To properly treat and care for a wound, a comprehensive analysis of intrinsic and extrinsic factors is necessary. Such factors include but are not limited to age, presence of chronic disease, tissue perfusion, oxygenation, immunologic response, wound protection, medications, nutritional deficits, irradiation, chemotherapy, wound necrosis, infection, quality of wound care, whole patient care, etc.

Assessing the wound is a thorough and detailed step, which guides any and all future treatment decisions. There are numerous methods and systems developed to classify wounds based on either the level of tissue involvement or encompassing specific wound etiologies (Sussman et al. p.89). Examining and describing the wound attributes include location, age of wound (days/weeks/months), size (length and width), stage or depth, evaluation for undermining or tunneling, presence or absence of characteristics that would hinder or aid wound healing (eg. necrotic tissue/escar, erythema, edema, infection, condition of wound edges, granulation tissue, epithelialization, etc.), and a description of exudate if present (color/type, volume, odor, consistency). One must not overlook the examination of the surrounding tissue or periwound environment as this may provide detailed clues that can identify the health of the skin, phase of wound healing and the patient's overall health status. These attributes include skin texture, scar tissue, callus, maceration, edema, color, sensation, temperature, hair distribution, toenails, and blisters. The assessment should be updated on every encounter.

Continuing with wound characterization, one must determine the current stage of wound healing as well as clarify the wound healing status. This may be as simple as acute or chronic terminology. In addition, the etiology of a wound needs to be uncovered to be able to treat the source of the wound. Here, one takes into consideration the need for additional testing to assess wound-healing capabilities. These tests can include the ankle-brachial index (ABI), continuous wave doppler, duplex ultrasound, roentgenographs, magnetic resonance imaging/angiography, and transcutaneous tissue oxygen measurements. Finally, the decision for treatment can be made which includes the utilization of referrals. The goal of applying a dressing is to improve the wound's overall healing abilities by providing a moist environment.

Wound management is a comprehensive, multidisciplinary approach to care for the patient and the healing wound. This includes a clear understanding and knowledge of wound

(Abstract truncated due to its length)

CASE REPORT: WEGENER'S GRANULOMATOSIS IN A 19-YEAR-OLD MALE

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This is the case of a 19-year-old male who presented with new-onset Wegener's granulomatosis, a rare disease in which delay in diagnosis would mean dire consequences for the patient. Advances in medicine have shed better understanding on this disease and resulted in improved outcomes for patients diagnosed with Wegener's granulomatosis.

DIABETIC MYONECROSIS

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Introduction: Diabetic Myonecrosis is an uncommon complication of (DM), presenting with severe pain in the medial thigh. Diabetic myonecrosis is often misdiagnosed as a Neoplasm, an abscess, or myositis. Significant proportions of patients do not comply with their insulin regimen and as a result have poor diabetic control for 5 to 30 years (mean, 15 years).

Diabetic myonecrosis is unique as it occurs in young adult (Mean age, 37 years) and is more common in Females. The etiology may be atheroembolism or Arteriosclerosis obliterans. The pathophysiologic Pathway of Diabetic myonecrosis is controversial. Some investigators propose, a compartmental Syndrome exacerbating Ischemia versus abnormalities in the clotting cascade or in Fibrinolytic Pathways.

Case Presentation: Patient is a 46 y/o African American Male with h/o longstanding Diabetes Mellitus type II (HgA1c: 13.6) With Retinopathy and Peripheral Neuropathy and HTN, presenting With few months history of right leg pain and swelling. Movement Makes the pain worse, No associated trauma to the leg, or fever & Chills.

Conclusion: Diabetic Myonecrosis is an uncommon, missed sign Of underlying chronic vascular disease. Most patients reported in Literatures are relatively young with a mean 15 yr history of diabetes With poor chronic control. The pathophysiology is not understood yet. With an appropriate clinical history and typical MRI findings, a Diagnosis of DMI can often be made, permitting conservative Management. In atypical cases, or where clinical doubt persists Regarding the diagnosis, biopsy can be performed.

SOMATIC EXPERIENCING TREATMENT IN AN 8-YEAR OLD BOY SUFFERING FROM PTSD: A CASE REPORT

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Somatic experiencing (SE) is an emerging therapeutic modality that shows promise in being able to treat post-traumatic stress disorder (PTSD). PTSD is a debilitating condition that is commonly treated through two psychotherapy techniques called cognitive behavioral therapy (CBT) and eye movement desensitization and reprocessing (EMDR). However, preliminary observations suggest that SE may be an effective, single-treatment option in lieu of the more extensive traditional therapies. This case report describes implementation of the SE technique in a family medicine clinic setting, on an eight year old child suffering from PTSD as a result of being bitten by a dog. The outcome of this SE implementation, occurring within a twenty minute office visit, resulted in immediate and full resolution of symptoms. This case report lends further evidence to the burgeoning SE technique as a viable modality in trauma therapy alongside CBT and EMDR. Additionally, this case report demonstrates that SE can be implemented effectively and in a timely manner in the medical setting, including out-patient offices and emergency rooms.

EVALUATION OF PRE-HOSPITAL AND EMERGENCY DEPARTMENT SYSTOLIC BLOOD PRESSURE AS A PREDICTOR OF IN-HOSPITAL MORTALITY

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Trauma patients need an organized team of professionals in a specialized trauma center to receive efficient medical care. Trauma activation at Arrowhead Regional Medical Center (ARMC) is well established and primarily focuses on mechanism of injury, anatomy, and physiology. Hospitals nationwide typically follow the guidelines established by the American College of Surgeons Committee on Trauma to create trauma activation criteria. Some of these variables have been scientifically validated; however, they have not been studied as independent predictors of mortality. The present study focuses on pre-hospital systolic blood pressure (SBP) with emergency room SBP as one variable used to predict in-hospital mortality at ARMC. The goal is to assist in the triage and prognosis of trauma patients that fall within the systolic blood pressure categories.

This is a retrospective observational analysis of all trauma patients seen at ARMC over a 5-year period. Patients who were dead on arrival, those transferred to another facility for higher level of care, or with incomplete data in the emergency room were excluded. A total of 6,964 patients were analyzed. Patients were categorized into 4 different groups based on their pre-hospital systolic blood pressure readings. Severe hypotension, defined as SBP ≤ 80 mmHg; moderate hypotension, defined as SBP 81-100 mmHg; mild hypotension, defined as SBP 101-120 mmHg; and normotension, defined as SBP >120 mmHg. Each of the 4 groups was further sub-categorized based on whether the patients were hypotensive or not in the emergency department, defined as systolic blood pressure ≤ 90mmHg. The overall mortality for patients with severe pre-hospital hypotension was 18.1%. Patients who had both severe pre-hospital hypotension as well as ER hypotension had mortality of 50%. Odds ratio analysis demonstrated that there was a 9-fold increase in mortality in patients with severe pre-hospital hypotension compared to all other patients with a pre-hospital systolic blood pressure >80 mmHg.

The data illustrated a physiologic expectation; a low blood pressure in the field and a low blood pressure in the emergency department is associated with poor prognosis. However, this study elucidated the severity of the expected poor outcome. The odds ratios consistently depict that pre-hospital hypotension and ED hypotension show a decreased in hospital survival. This information is important for the ARMC trauma team in order to have a higher index of suspicion about the severity of a traumatically injured patient based on severe pre-hospital hypotension.



DRESS SYNDROME AFTER THERAPY WITH LITHIUM

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Drug Rash with Eosinophilia and Systemic Symptoms (DRESS), also known as Hypersensitivity Syndrome is a severe adverse drug reaction clinically characterized by fever, cutaneous manifestations that range from a morbilliform eruption to exfoliative dermatitis, eosinophilia, lymphadenopathy and visceral involvement most commonly being hepatitis, but can include myocarditis, nephritis, pneumonitis and thyroiditis. The differential diagnosis includes: other cutaneous drug eruptions, acute viral infections, idiopathic hypereosinophilic syndrome, lymphoma and pseudo-lymphoma. Removal of the offending agent and corticosteroids are first-line therapy for DRESS syndrome, however, milder cases can be treated topically with a high-potency corticosteroid.

This case report describes an 18 year old female with manifestations of DRESS syndrome soon after initiating therapy with lithium for Bipolar disorder. Although DRESS syndrome is commonly reported in patients after use of anticonvulsants such as carbamazepine, phenytoin, and phenobarbital, to my knowledge there have been no reports of DRESS syndrome in association with lithium use.

FONTANA HEALTH CLINIC PATIENT SAFETY CULTURE SURVEY

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Objective: The survey instrument used in this study was taken from the Agency for Healthcare Research Quality (AHRQ), the lead Federal agency charged with conducting and supporting research to improve patient safety and health care quality for all Americans. The purpose of the study was to gauge the patient safety mindset of the staff at the Fontana Health Clinic. The survey was designed to 1) provide a view of the current patient safety climate at the clinic, 2) provide an assessment of employee opinions, attitudes, and concerns, 3) communicate key messages to employees about what is important, 4) document frequency of events reported, 5) provide a release valve for employees (to speak their minds), 6) communicate results to clinic and hospital administrators to determine areas of priority and improvement in patient safety, 7) serve as a baseline survey and comparison for progress over time against opportunity areas, 8) compare our results to the AHRQ's national database average.

RESULTS: In November, 2007, a total of 40 clinic staff at Fontana Health Clinic participated in the survey instrument. The results of the survey items were found to populate the desired positive categories except for staffing. Most of the people in the clinic feel that there is not enough staff to handle the workload. Nurses feel that their mistakes are held against them and are kept in their personal file. Clinic assistants disagreed to the statement that "staff feel free to question decisions or actions of those with more authority". Resident physicians disagree to the statement that "staff in this unit work longer hours that is best for patient care". Frequency of error reporting was also an area of concern and showed the clinic was below the national average.

CONCLUSION: The survey instrument educated the staff and built awareness about issues of concern related to patient safety at the clinic. The survey provided a glimpse of the patient safety culture at the Fontana Health Clinic and it also provided a release valve for staff to voice out opinions. It is intended to reduce any "climate of blame" in the clinic and to encourage error reporting which has been a constant problem according to literature. There is evidently a climate of blame that exists at the Fontana Health Clinic and this needs to be improved upon. Staffing is also a major problem identified. If staff feels that their mistakes are not held against them, more errors would be reported, hence, safety problems would be identified and actions plans can be implemented to prevent patients from harm. This survey would hopefully not be the end but the beginning of action planning to improve the safety culture in the clinic and would serve as baseline for comparison for future surveys.



A RETROSPECTIVE STUDY OF MATERNAL ICU ADMISSION IN A COUNTY HOSPITAL SETTING FROM 2004-2007 AND REVIEW OF LITERATURE

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Objectives: Pregnancy increases a woman's chance of morbidity or death. We used maternal ICU admissions as a proxy for severe maternal morbidity. Our goals were to describe the major diagnoses and hospital course leading to a maternal ICU admission in a county hospital setting.

Methods: We performed a retrospective review of all ICU admissions involving pregnant or post-partum women at a suburban county hospital over a 3 year period (2004-2007). Charts were abstracted and underwent a two tier review. Each case was summarized. We focused on outpatient and inpatient medical care, in addition to the hospital course once in critical care.

Results: We identified 50 cases (1 maternal ICU admission/ 200 deliveries). The main diagnostic categories are listed in the table below. There was one maternal death from cardiac disease (non-preventable) and 3 cases of long-term major morbidity. 80% of patients had either one or more contributing co-morbidities (maternal substance use, chronic hypertension, diabetes, obesity, renal disease, pancreatitis, previous cesarean, psychiatric disease and cardiac disease predominated). 70% of these ICU admissions involved morbidity which was directly pregnancy related. 30% involved severe medical complications which were only indirectly related to the pregnancy.

14 cases of post-partum hemorrhage
12 cases of severe preeclampsia/HELLP
8 cases of pulmonary disease
4 cases of CNS morbidity
4 cases of sepsis
3 cases endocrine/metabolic disorders
3 cases of cardiac disease
2 cases of adverse drug reactions

Conclusions: Our rate of ICU admissions is similar to other estimates (approx 1/200) of severe maternal morbidity in pregnancy. The major diagnoses are also consistent with the literature. The presence of multiple co-morbidities contributed to the severity of illness and created diagnostic and therapeutic challenges for the managing physicians. Attempts at decreasing severe morbidity in patients like these require frequent and comprehensive evaluations.

ULNA-TO-STATURE RATIO AS A PREDICTOR OF BREAST CANCER

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Introduction: Recent epidemiologic studies have investigated the possibility that exposure during very early life to hormones or their analogues increases adult cancer risk. A highly estrogenic intrauterine environment may lead to a greater risk for breast cancer in adulthood.

Objectives: Estrogens and androgens are two of several hormone groups that regulate long bone growth during childhood and adolescence. Rising estrogen levels at the onset of adolescence are thought to stimulate long bone growth in girls. Later at the end of adolescence, an estrogen signal is responsible for the end of long bone growth. Some portion of the variance in long bone lengths may be due to variable amounts of estrogen exposure. Long bone to stature ratios have not been systematically examined in breast cancer patients. We propose to examine women with breast cancer to determine if they have ulna to stature ratios and other anthropometric traits that differ from control populations.

Methods: We conducted a retrospective study recruiting breast cancer patients (n=138) and control subjects (n=192). Women over 18 and under 75 years of age were enrolled from white, black, and Hispanic ethnic groups from 5 local Southern California hospitals. Subjects designated as the breast cancer group or control group were recruited from a pool of inpatients, outpatients and visitors. Ulna length was determined using an osteometric board with the elbow seated against the back of the board; the edge of the styloid process was marked on a paper recording sheet on the board. Measurements were made in triplicate to the nearest 0.1 mm.

Results: We performed an ANOVA analysis to compare ulna-stature ratio in breast cancer versus control in Hispanics, whites and blacks. In the black population, the ulna-stature ratio in the breast cancer group was significantly higher than in the control group with $p = .04$. A similar trend was observed in whites, $p > .05$. However, in Hispanics, the breast cancer group was not significantly different from the control group, $p > .10$. In all ethnic groups breast cancer patients were older than controls. This raises the question of whether age might be a factor in any difference observed between groups. A regression analysis of age and ulna-stature ratios showed no significant difference between breast cancer and control groups for any of the three ethnic groups. Other factors might also have contributed to variation in the ulna to stature ratio. Since the maternal gestational hormone environment may vary systematically for different sibship positions, we examined how birth order may potentially influence ulna to stature ratio in breast cancer and controls. Over all ethnic groups, birth order was a significant source of variation in ulna to stature ratios ($F_{3,256} = 3.95$, $p = .0089$). However, the interaction of birth order and disease was not significant.

Conclusion: The results of this study do not provide strong evidence to support the hypothesis that increased estrogen exposure early in life can lead to future development of breast cancer. If one assumes that ulna:stature ratios are inversely related to early

SENSITIVITY OF ULTRASOUND IN SCREENING FOR ENDOMETRIAL PATHOLOGY IN PATIENTS WITH ABNORMAL UTERINE BLEEDING

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Objective: The purpose of this study was to evaluate whether determination of endometrial thickness and endometrial biopsy are both necessary to adequately assess patients with abnormal uterine bleeding. The null hypothesis is that endometrial biopsy is not necessary if the endometrial thickness is normal on ultrasound examination. The alternative hypothesis is that abnormal endometrial thickness will detect endometrial abnormalities, making biopsy unnecessary.

Material and Methods: Medical records from patients that underwent endometrial biopsy and their concomitant endometrial thickness measured by ultrasound were reviewed. A total of 402 charts met inclusion criteria (abnormal uterine bleeding, pelvic sonogram, pathology report). Data collected included age, endometrial thickness expressed in millimeters, and endometrial biopsy results (stratified into benign, atypical, insufficient, and malignant).

Results are expressed in the table below:

Age (Years)	≤ 40	40-50	>50- <60	≥ 60
Endometrial thickness + std error	41 ± 5	42 ± 3	23 ± 4	29 ± 7
Atypical or Malignant (%)	1.2	2.5	1.2	8.6
N	83	199	84	35

All significant histologic abnormalities corresponded to an endometrial thickness > 20 mm.

Conclusions: We found significant variation in the mean thickness of the endometrium, trending to decrease as the age of menopause approached. The observed results seem to suggest that pelvic ultrasonography has limited sensitivity to detect endometrial cancer. However, if the ultrasound study is performed for other indications, an endometrial thickness of less than 5 mm would help rule out significant pathology.

EFFICIENCY OF ANTEPARTUM NON-STRESS TESTING AT ARROWHEAD REGIONAL MEDICAL CENTER

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Objective. The purpose of this study was to establish the average time to fetal heart rate reactivity and whether present resources utilization are maximized.

Methods. To assess the time interval between an NST becoming reactive and the interval at which the NST was discontinued, a prospective review of chart, not randomized, was performed in a prospective manner (as not to be influenced by outcome). The time to reactivity, defined as the length of time for fetal heart rate tracing to demonstrate two 15 beat by 15 second duration accelerations, was measured. Additionally, total time monitored, gestational age, indication for NST, amniotic fluid index (AFI), presence of contractions, and presence of fetal heart rate decelerations were noted.

Results. The average time interval from reactive to discontinuation of NST was 19.1 min ± 1.2 (SEM). There was no trend noticed in the time of the day and the length to discontinuation of the test.

Conclusion. From this sample it seems that there are opportunities to become more efficient with the performance of NST. This could contribute to overall patient satisfaction



DO INCREASED AMOUNT OF OMEGA-3 FATTY ACIDS IMPROVE SYMPTOMS OF DEPRESSION?

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Objective In patients with Major Depressive disorders (MDD), lower serum levels of eicosapentaenoic acid (EPA) were found compared to controls [1, 9]. Moreover, most of the EPAs in the brain are of the ω 3 type and its deficiency was observed to be related to the serotonergic or catecholaminergic disturbances in MDD [8]. The objective of this study is to compare the symptoms of depression at baseline and the same after increasing oral intake of foods high in Omega-3 FA.

Study Design A prospective clinical study in a group practice county Family Health Clinic setting.

Results In more than 50% of the patients with Major Depressive Disorder assessed over at least a 2-4 month period, 2-4 symptoms were reported to have improved after increased intake of foods high in Omega-3 FA. Statistical significance is still to be determined.

Conclusion Although there may have been a subjective improvement in the symptoms of depression, many other factors can confound this simple correlational relation. The number of subjects, the amount of Omega-3 FA intake, and the use of antidepressant medications all need to be accounted for. The exact benefit of an increased intake of foods high in Omega-3 FA remains to be determined.

EXTRACRANIAL CAROTID ARTERY ANEURYSMS: A CASE REPORT

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Introduction

Extracranial carotid artery (ECA) aneurysms are extremely rare, as only about 2600 of them have been reported. Therefore it is impossible to define their true incidence and information about immediate and long term results of surgical therapy is sparse. However, with the increasingly widespread use of technology, such as ultrasound, angiography, and other modalities, ECAs are recognized more often than before. The etiology of these aneurysms include atherosclerotic disease, trauma (penetrating and blunt), infection, congenital aneurysms, and pseudoaneurysms resulting from prior carotid surgery. The primary complications of untreated ECAs are rupture, thrombosis, and embolism, resulting in vast array of neurologic deficits. Treatment includes surgical resection of the aneurysm and restoration of arterial continuity.

Case Report

A 79 year old male with HTN, hyperlipidemia and a right carotid bruit underwent a screening carotid ultrasound. He had no history of strokes, weakness, numbness or tingling. The ultrasound showed bilateral internal carotid artery stenosis of 50-79%, and a small focal outpouching of the proximal left internal carotid bulb. A CT angiogram of the neck depicted a saccular aneurysm (12x9x8 mm) of the proximal left internal carotid artery just above the bifurcation. Due to the risk of neurologic events and rupture, the patient underwent successful left carotid endarterectomy with patch angioplasty and excision of carotid aneurysm. There were no operative complications and the patient was discharged home the following day.

Conclusion

Satisfactory long-term results with surgery have been reported in the current literature, and due to the potential risks of cerebral ischemia and rupture, surgical repair is warranted in the treatment of ECA aneurysms.

INTRACRANIAL ARTERIAL FENESTRATION AND ASSOCIATION WITH ANEURYSM: A CASE-CONTROL RETROSPECTIVE STUDY AND REVIEW OF LITERATURE

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BACKGROUND AND PURPOSE: Cerebral artery fenestration is rare but well-recognized congenital anomaly that can occur anywhere in the anterior and posterior cerebral arterial circulation. Fenestration is believed to be a consequence of incomplete fusion of bilateral primitive longitudinal neural arteries during the fetal period [Padget et al]. Their clinical significance lies in their possible association with arterial aneurysms either at the site of the fenestration or in a separate location. Although their association has been frequently mentioned in many case reports, there are only a small number of published studies done to evaluate their association. The majority of published reports detected fenestrations using cerebral angiograms. There are very few reports studying the association of fenestration using CTA or MRA. This is clinically important as convention moves away from cerebral angiograms to MRA and CTA as the imaging modality of choice of initial evaluation of the cerebral vasculature. To our knowledge, this is the first case-control retrospective study on cerebral artery fenestration and their association with aneurysm evaluated by one of or in any combination of the following: cranial MRA, CTA and cerebral angiography.

METHODS: We compiled a database of cerebral MRA, CTA, and Angiography reports containing the key words fenestration and/or aneurysm from July 1, 2001 to February 5, 2007. Each fenestration case was retrospectively reviewed by a board certified radiologist for confirmation of fenestration location and aneurysm if present. The incidence and odds ratio was then calculated from this study population.

RESULT: Our study found the incidence of cerebral artery fenestration to be 0.60%. The highest incidence of fenestration occurred in the basilar artery (0.36%), followed by anterior communicating artery (0.13%), anterior cerebral artery (0.07%), Middle cerebral artery and vertebrobasilar junction (0.04%) and Posterior cerebral artery (.02%) accordingly. We did not find any fenestration along the internal carotid arteries. The odds ratio of a patient with cerebral artery fenestration also having aneurysm was 1.18. Of the 36 patients with fenestration(s), twenty-one was female and fifteen were male. The percentage of female fenestration patients with aneurysm was 19% and male fenestration patients with aneurysm were 20%. The odds ratio of fenestration occurring with aneurysm is 1.18.

DISCUSSION: As a tertiary referral center for stroke, trauma, and oncology, we expected to find a higher incidence of cerebral artery fenestration than other institutions. However, our incidence was within the wide range of incidence reported in literature. The incidence of fenestration occurring with aneurysm either at the same site of fenestration or at a satellite location was only 0.12%.

(Abstract truncated due to its length)

THE EFFECTIVENESS OF THE FOUR COMPONENT STUDY PLAN ON RESIDENT SCORES ON THE AMERICAN BOARD OF FAMILY MEDICINE IN-TRAINING EXAM.

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In an attempt to determine why some residents reach the mean on the annual ABFM In-Training Exam (ITE) and others do not, a survey was conducted to determine whether the number of components used of a Four Component Study Plan made a difference in resident scores, and ultimately whether residents using the Plan met the mean on the ITE or not. The survey found no significant difference in study components used between residents. The data is inconclusive, though, as to whether the Four Component Study Plan makes a difference on ITE scores. This is secondary to faults in the survey design, which are discussed below. If, on future surveys, it is found that the Four Component Study Plan influences whether or not a resident does well on the ITE, it will provide guidance as to how to set up study plans for residents on the PIP.

THE IMPORTANCE OF BCL-XL IN THE SURVIVAL OF HUMAN RPE CELLS

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PURPOSE. In both normal eyes and diseases such as age-related macular degeneration (AMD) and proliferative retinopathy (PVR), retinal pigment epithelial (RPE) cell survival is critically important. We have shown that Bcl-x_L is among the most highly expressed survival factors in cultured human RPE cells. Here we determine the effect of Bcl-x_L blockade on human RPE cell survival under normal conditions and following induced oxidative stress.

METHODS. Cultured human RPE cells were transfected with the following modified, 2'-O-methoxyethoxy anti-sense oligonucleotides (ASO): Bcl-x_L-specific, Bcl-x_L-mismatched control and Bcl-x_L splice switching (SSO), which shifts the splicing pattern of Bcl-x pre-mRNA from Bcl-x_L into Bcl-x_S, a pro-apoptotic factor. RNA and protein were harvested at various time points after transfection. Bcl-x_L and Bcl-x_S mRNA transcript levels were analyzed using gene-specific primers with real-time RT-PCR, and RT-PCR, respectively. Bcl-x_L protein levels were analyzed using Western blot. Cell viability was measured by WST-1 and LDH assays. The mode of cell death was determined with the Cell Death ELISA and an M30 assay. To study the effects of oxidative stress, cells were stimulated after transfection with varying concentrations of H₂O₂. Cell viability was analyzed by WST-1 and LDH assays.

RESULTS. Following Bcl-x_L-specific and SSO transfections, Bcl-x_L mRNA and protein levels were significantly reduced. Bcl-x_S level was increased after transfection with SSO. By day 5, cells transfected with Bcl-x_L-specific ASOs had significantly decreased viability, which was further reduced by day 7. The SSO had an even more potent effect; cell viability was reduced one day after transfection and by day 7, less than 10% of the cells were viable. Apoptotic cell death occurred as early as one day following transfection. H₂O₂, used as a model oxidant, further enhanced cell death induced by Bcl-x_L-specific and SSO.

CONCLUSION. Bcl-x_L plays an important role in human RPE cell survival under normal conditions and oxidative stress. Treatment strategies that enhance Bcl-x_L expression and/or prevent conversion of Bcl-x_L to Bcl-x_S may be useful to prevent RPE cell death in AMD. Treatments that reduce Bcl-x_L and enhance Bcl-x_S may be useful to inhibit unwanted RPE cell proliferation in PVR.

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(Department of Emergency Medicine)

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