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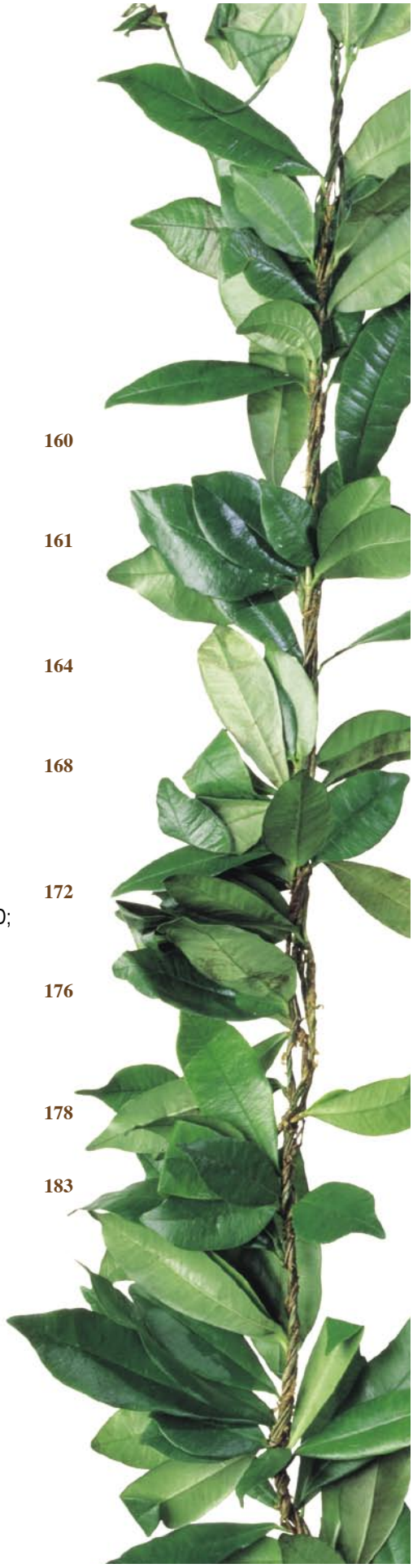

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Editorial Commentary

From time to time, articles appear outside of the busy physician's usual reading list which pass unnoticed by the medical community yet can be of significant importance and value to many of us. As the editors become aware of such material, we will bring it to your attention. The more we know, the better decisions we can make.

Beh H, Ross R. Non-Compete Clauses in Physician Employment Contracts Are Bad For Our Health. *Hawaii Bar Journal*. 2011;14:79-90.

This article describes and documents the rather anomalous position of the Hawaii Judicial System in generally supporting the employer as opposed to the individual employee and the potentially negative consequences of this policy in a time of worsening physician shortage.

Brenner D. Are Airport Backscatter Scanners Safe for Airport Passenger Screening? *Radiology*. 2011;259:6-10.

Schauer D. Does Security Screening with Backscatter X-Rays Do More Good than Harm? *Radiology*. 2011;259:12-16.

The two articles listed represent perhaps the most rational and non-sensational materials presented to the general public about this contentious topic. Dr. Brenner is an excellent researcher and not given to overstatement but his conclusion that "…a billion scans per year raises long term public health concerns…" should give us all pause.

Obuchowski N, Graham R, Baker M, Powell K. Ten Criteria for Effective Screening. *American Journal Roentgenology*. 2001;176:1357-1362.

This specific article from the Cleveland Clinic addresses the application of criteria for CT screening of Pulmonary and Colorectal CA, a topic of much interest in the current press. The points bought out are, however, applicable to almost all tests, laboratory, imaging or other, and give a rational basis for decision-making. This is an excellent article to give patients concerned about screening tests.

S. Kalani Brady MD and Michael J. Meagher MD; HMJ Co-Editors

Moyamoya Disease in Pregnancy: A Case Series and Review of Management Options

Jacklyn C. Ma MSIV and Janet M. Burlingame MD

Abstract

Background: Pregnancy has a potentially deleterious affect on moyamoya disease (MMD), a cerebrovascular condition characterized by spontaneous occlusion of the distal internal carotid arteries resulting in the neoangiogenesis of fragile collateral blood vessels. The disease renders patients susceptible to both hemorrhagic and ischemic stroke.

Methods: A 16-year (1995-2010) chart review was performed at the Kapi'olani Medical Center for Women and Children and the Queen's Medical Center, the two largest birthing centers in Hawai'i.

Results: The authors report on three women with MMD who had the revascularization surgery prior to their first pregnancy and experienced successful pregnancy outcomes without the MMD symptoms. Two of these were managed with antiplatelet agents, one with calcium channel blockers, and two with magnesium sulphate in the perioperative period.

Conclusion: The authors' cases demonstrate different medical therapies, which may be of benefit for MMD with and without revascularization surgery during pregnancy.

Introduction

Moyamoya (Japanese for misty) disease (MMD), a condition occurring predominately in Japanese women, is a cerebrovascular condition characterized by spontaneous bilateral occlusion of the distal portion of the internal carotid arteries. The incidence in Japan is reported to be 0.35 per 100,000 compared to the continental United States where the incidence is about 0.086 per 100,000.[1] Given the large Asian population in Hawai'i, there is a higher rate of MMD in Hawai'i than in the rest of the United States.[2] Several case studies describe MMD in pregnancy, but no guidelines exist to date for the management of MMD in pregnancy.[3]

Although there is no evidence to support the theory that MMD would increase the maternal risk of morbidity and/or mortality, it is assumed that the normal physiologic changes that occur during pregnancy would make women with MMD more susceptible to cerebrovascular events. The pathophysiology of MMD and pregnancy poses specific concerns including a pregnancy-associated increased risk of thrombosis as well as increased cerebral perfusion pressure, stresses of labor and hypertensive diseases.[3] Thus, the clinician is faced with several management decisions including the role of surgical revascularization, medical management, optimal mode of delivery, and optimal anesthetic management.

Methods

A 16-year (1995-2010) chart review was performed at the Kapi'olani Medical Center for Women and Children (KMCWC) and the Queen's Medical Center (QMC), the two largest birthing centers in the State of Hawai'i, using the hospitals' CareLink and Epic patient records networks. A total of three pregnant women with a diagnosis of MMD before a pregnancy were identified by ICD-9 discharge diagnoses.

Results

During this 16-year period (1995-2010), a total of 7 MMD cases were diagnosed at the KMCWC and QMC out of a total of 121,674 live births (5.75 per 100,000 live births), of which 3 MMD cases (2.47 per 100,000 live births) were diagnosed before a pregnancy.

Case 1

A 31-year-old Japanese American woman presented with a history of repeated episodes of dysphasia, right upper extremity weakness and involuntary movements. She was diagnosed with MMD by magnetic resonance angiogram (MRA), which also showed evidence of collateral blood flow. She elected to undergo encephaloduroarteriosynangiosis (EDAS) and did not experience any further neurologic symptoms.

Her first pregnancy occurred five years after the revascularization surgery. She was treated with Aspirin/Dipyridamole (25/200 mg), Aspirin (81 mg) and Nifedipine XL (30 mg) throughout the pregnancy and peripartum period. She developed intrauterine growth restriction and mild preeclampsia at 37 weeks and underwent elective Cesarean section under spinal anesthesia. She denied having any neurologic symptoms at the time and was started on magnesium sulfate prophylaxis, which was continued for 24 hours postoperatively. She delivered a healthy baby girl with Apgars of 8 and 9.

Her second pregnancy occurred 2½ years later. She denied having any neurologic symptoms in the interval period. Similarly, she was treated throughout this pregnancy with Aspirin/Dipyridamole, Aspirin, and Nifedipine XL, and her pregnancy was complicated by mild preeclampsia at 35 weeks. At 37 weeks she was started on magnesium sulphate prophylaxis and underwent repeat Cesarean section with spinal anesthesia, and delivered a healthy baby boy with Apgars of 8 and 9. She had an uncomplicated postoperative course and magnesium sulphate was continued for 24 hours after delivery.

Case 2

A 36-year-old G1P0 of unknown ancestry was diagnosed with MMD after experiencing two episodes of ischemic stroke. She elected to undergo EDAS that same year, but it is not known whether she experienced any transient ischemic attack (TIA) or other neurological events in the interval period. Her first pregnancy occurred 3 years later and was uncomplicated. She was maintained on Aspirin (81 mg) twice daily until 36 weeks. She delivered a viable infant via cesarean section under epidural anesthesia with Apgars of 8 and 9. She experienced no neurologic events in the peripartum period.

Her second pregnancy occurred three years later and she reported no interval neurological events. She received prenatal care, was on Aspirin (81 mg) daily, and her pregnancy course was uncomplicated. She underwent repeat Cesarean section at 39 weeks under epidural anesthesia and delivered a viable infant with Apgars of 8 and 9. No neurologic events were reported in the peripartum period.

Case 3

A 20-year-old G3P2 of Micronesian ancestry was diagnosed with MMD by MRA six years prior to this third pregnancy and underwent EDAS without reports of subsequent neurologic symptoms. She had a history of two prior Cesarean sections occurring after the revascularization surgery, one at 33 weeks and one at term due to breech presentation. There were no other complications during her first two pregnancies and no reports of neurologic symptoms during this time period.

She was admitted in preterm labor at 30 weeks for this pregnancy, was unresponsive to medical therapy with magnesium sulphate and underwent repeat Cesarean section under spinal anesthesia delivering a viable infant with Apgars of 4 and 8. She experienced no neurological symptoms during the peripartum period.

Discussion

There are limited studies that review the presence of MMD in pregnancy or that describe repeat pregnancy in these patients. The authors' cases suggest that with thoughtful management of the increased risk of thrombosis and increased blood volume during pregnancy, as well as an increase in intracranial pressures and hypocapnia during labor, women with MMD can have safe and successful pregnancy outcomes.

Moyamoya Disease in Pregnancy

The pathophysiology of MMD is not completely understood, but pathological analysis shows evidence of luminal thrombosis, hyperplasia of smooth muscle cells, a thinned media, and a weakened arterial wall. In response to the occlusion of the distal internal carotid arteries, fragile collateral blood vessels and small microaneurysms develop, which are due to changes in circulatory patterns and sheer stresses at bifurcations at the base of the brain. Hemorrhagic stroke is attributed to the fragility of these collateral vessels and is more common in adults than children with MMD. Furthermore, the normal cerebral blood vessels undergo vasodilatation in response to chronic ischemia and any decrease in cerebral perfusion pressure predisposes the patient to ischemic stroke in already maximally dilated cerebral blood vessels. It is hypothesized that the physiologic changes during pregnancy may affect the natural history of the disease since there is evidence that the development of collateral vessels may be due to the upregulation of proangiogenic enzymes in response to increased blood flow.[1]

Although uncommon, studies show that pregnancy is associated with a 34% increased risk of stroke. Along with certain risk factors, the most common underlying medical conditions were reported to be thrombophilia, lupus, heart disease, sickle cell disease, hypertension, and thrombocytopenia.[4] Even if the actual statistics are not reported, MMD can be regarded as a rare cause of stroke in pregnancy. However, the incidence of cerebrovascular events in a patient diagnosed with MMD is high at 50-75%.[1] It ensues, then, that the increased risk of stroke that accompanies pregnancy would exacerbate the risk associated with MMD, but no studies have shown an increased risk of cerebrovascular events in pregnancy, or how the development of eclampsia or preeclampsia affects this risk.[3] Pregnancy is associated with an increased risk of thrombosis due to elevated levels of estrogen, decreased fibrinolytic activity, and increased plasma volume.[4] Patients with MMD form emboli at the sites of arterial stenosis, perpetuating the baseline prothrombotic state that comes with pregnancy and further increasing the risk for ischemic stroke.[1] The development of severe preeclampsia could cause a rapid deterioration of symptoms due to a cerebral vasospasm, hypertensive encephalopathy, and a heightened sympathetic drive. High cerebral perfusion pressures overcome the limits of intrinsic autoregulation leading to endothelial damage, vasogenic edema, and barotrauma, which increase the risk of hemorrhagic stroke.[5]

There are no prospective trials that address the safest mode of delivery for women with MMD. During labor, Valsalva and increased intracranial pressure can cause hemodynamic stresses on the fragile cerebral blood vessels, predisposing the patient to hemorrhagic stroke. Hyperventilation, alkalosis, and hypocapnea can cause a resultant decrease in the cerebral perfusion pressure, predisposing the patient to ischemic stroke as well. In this case series, women with known MMD (BP1 and BP2) were offered either a Cesarean section or assisted vaginal delivery with epidural anesthesia, and they opted for a Cesarean section. Patient BP3 had a repeat Cesarean section. It remains unclear however if elective Cesarean section is of benefit to women with MMD.[3]

It is worth noting that for the four patients who were diagnosed with MMD after pregnancy, it is impossible to know if the disease was already present during pregnancy. Since MMD is progressive with age, it can be said that the lack of significant arterial stenosis may account for the absence of clinical symptoms, and the hemodynamic changes during pregnancy may affect the natural history of the disease.[1]

Anesthetic Management

In 2005, Kato et al,[6] reported five cases of neuraxial anesthesia (epidural and combined spinal-epidural) in women with MMD undergoing Cesarean section. A careful anesthetic plan must be developed for women with MMD with the goal of strict blood pressure control and prevention of extremes in Pco_2. Hypocapnea can reduce cerebral perfusion pressure, but on the other hand, hypercapnea can also reduce perfusion to the areas of the brain affected by MMD via a cerebrovascular steal phenomenon.[6]

In a patient with MMD, the assessment of neurologic status is extremely important and direct observation is best for assessing neurologic status.[6] The benefits of neuraxial anesthesia over general anesthesia include the ability to perform on-going neurologic assessments and avoid hypertension. Therefore, neuraxial anesthesia with prior sedation is recommended as the anesthetic method of choice while leaving the choice of neuraxial anesthesia to the discretion of the anesthesiologist.

Surgical Treatment

There is no curative treatment that exists for MMD. The role of a surgical intervention is palliative rather than definitive and is used to treat the effects of cerebral ischemia. Some authors advocate for surgical treatment of MMD prior to pregnancy, but the absolute benefit has not been shown.[3] Surgical treatment involves extracranial-intracranial revascularization (EC-IC bypass) through either a direct or indirect method. The direct revascularization is between the superficial temporal artery and the middle cerebral artery (STA-MCA) combined with placement of the temporal muscle over the brain surface, a procedure called encephalomyosynan-

giosis (EMS). The indirect method, however, is favorable because it is technically easier to perform. Vascularized tissue perfused by the external carotid artery (usually temporalis muscle or dura) is implanted in the brain with the hopes of stimulating angiogenesis in the underlying cortex. Examples of the indirect method include EDAS, encephalomyoarteriosynangiosis and pial synangiosis.[4] Case reports describing pregnancy following revascularization are few and the authors' cases support the utility and benefit of such procedures prior to pregnancy.[3]

The rationale for undergoing surgical revascularization is due to the progressiveness of the disease and patients' poor response to medical therapy. There is evidence to support the benefit of revascularization, as symptomatic progression of the disease occurs in 2.6% of patients undergoing surgery as compared to 66% of patients without treatment.[1] EC-IC bypass is believed to be of benefit to patients with MMD because it reduces blood flow through the fragile collateral vessels, reducing the risk of hemorrhage. Since the success of EDAS is dependent on the development of neovascularization, it may take between 3 to 6 months postoperatively for any reperfusion benefit to take place.[7] Therefore, one recommendation may be to undergo surgical revascularization at least 6 months prior to conception to maximize the benefit of surgery and reduce the risk of intracranial hemorrhage during pregnancy.

Medical Management

The authors' cases represent the first report of successful pregnancy outcomes in women treated with Aspirin/Dipyridamole, Nifedipine, and magnesium sulphate throughout the duration of pregnancy and in the postpartum period. No randomized trials about the use of these drugs by patients with MMD are available. These drugs, however, can offer a theoretical advantage. Antiplatelet drugs (aspirin and dipyridamole) decrease the risk of micoremoboli in the cerebrovascular circulation at preformed stenosis sites, a possible cause of ischemic episodes in patients with MMD. Given that the risk of thrombosis is increased during pregnancy, antiplatelet drugs may be even more beneficial than in the non-pregnant state. Furthermore, a recent study suggests that small microthrombi may contribute to the intimal thickening and reorganization involved in the pathogenesis of MMD.[1]

The benefits of calcium channel blockers for patients with MMD are believed to be due to their vasodilatory properties and their ability to reduce the occurrence and severity of ischemic episodes.[1] Their benefit in pregnancy includes the treatment or prevention of severe hypertension in patients with pregnancy-related hypertensive diseases.[5]

Magnesium sulphate is of theoretical benefit in patients with MMD due to its known vasodilatory properties. This may be secondary to its calcium antagonism, elevated levels of cyclic GMP, and alterations in the rennin-angiotensin-aldosterone system. This causes cerebral vasodialation and reduces cerebral perfusion pressure, which ultimately decreases the risk of cerebral barotrauma.[4] It may serve a dual purpose in patients with preeclampsia by preventing seizures.

Patients with MMD should be advised of the potential risks of pregnancy, and MMD should be considered when a pregnant patient presents with symptoms suggestive of a stroke. The authors report the first case series in the United States assessing the management of MMD in pregnancy. The authors' cases demonstrate several key management strategies that could be considered in the care of these patients: (1) the role of calcium channel blockers and antiplatelet agents throughout the duration of pregnancy and following delivery, (2) the potential benefit of magnesium sulphate in the peripartum period, (3) the utility of revascularization surgery for severe MMD cases, and (4) the uncertain benefit of a Cesarean section with neuraxial anesthesia especially if other conditions such as hypertension, preeclampsia, alkalosis, and hypocapnia warrant it.

Until further research is available, pregnant patients with MMD should be counseled about the risks and potential benefits of medical and surgical treatments and managed by a multidisciplinary team of obstetricians, neurologists, neurosurgeons, and anesthesiologists.

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References

1. Scott R, Smith E. Moyamoya disease and moyamoya syndrome. *New Eng J of Med* 2009;360:1226-37.
2. Graham JF, Matoba A. A survey of moyamoya disease in Hawaii. *Clin Neurol Neurosurg* 1997;Suppl 2:S31-5.
3. Komiyama M. Moyamoya disease and pregnancy: Case report and review of the literature. *Neurosurgery* 1998;43:360-8.
4. James A, Bushnell C, Jamison M, Myers M. Incidence and risk factors for stroke in pregnancy and the puerperium. *Obstet Gynecol* 2005;106:509-16.
5. Belfort MA, Anthony J, Saade GR. Prevention of eclampsia. *Seminars in Perinatology* 1999;23:65-78.
6. Kato R, Terui K, Yokota K, Nakagawa C, Uchida J, Miyao H. Anesthetic management for cesarean section in moyamoya disease: A case report of five consecutive cases and a mini-review. *Int J Obstet Anesth* 2006;15:152-8.
7. Karasawa J, Kikuchi H, Furuse S, Kawamura J, Sakaki T. Treatment of moyamoya disease with STA-MCA anastomosis. *J Neurosurg* 1978;49:679-88.

Ke kai lipolipo polihua a Kane (1729). "The dark-blue ocean of Kane." The deep sea out of sight of land.

Mary Kawena Pukui's 'Olelo No'eau: Hawaiian Proverbs & Poetical Sayings (Bishop Museum Press 1983)

A Polymorphism in the Retinol Binding Protein 4 Gene is Not Associated with Gestational Diabetes Mellitus in Several Different Ethnic Groups

Mark Hiraoka MD; Johann Urschitz PhD; Omar Sultan BS; and Kenneth Ward MD

Abstract

Objective: Various Asian and Pacific Islander groups have higher prevalence rates of type 2 diabetes and gestational diabetes. This increased incidence is likely to include genetic factors. Single nucleotide polymorphisms in the retinol binding protein 4 gene have been linked to the occurrence of type 2 diabetes. Hypothesizing a link between retinol binding protein 4 and gestational diabetes, we performed a candidate gene study to look for an association between an important retinol binding protein gene polymorphism (rs3758539) and gestational diabetes.

Study Design: Blood was collected from Caucasian, Asian, and Pacific Islander women diagnosed with gestational diabetes and from ethnically matched non-diabetic controls. DNA was extracted and real time PCR technology (TaqMan, Applied Biosystems) used to screen for the rs3758539 single nucleotide polymorphism located 5' of exon 1 of the retinol binding protein 4 gene.

Results: Genotype and allele frequencies in the controls and gestational diabetes cases were tested using chi-square contingency tests. Genotype frequencies were in Hardy-Weinberg equilibrium. There was no association between the rs3758539 retinol binding protein 4 single nucleotide polymorphism and gestational diabetes in the Caucasian, Filipino, or Pacific Islander groups.

Conclusion: Interestingly, the rs3758539 retinol binding protein 4 single nucleotide polymorphism was not found to be associated with gestational diabetes. The absence of association suggests that gestational and type 2 diabetes may have more divergent molecular pathophysiology than previously suspected.

Introduction

Gestational diabetes mellitus (GDM) remains one of the most common clinical issues that obstetricians face. It has an overall prevalence in the United States ranging from 1-14%.[1] Mothers with GDM have an increased risk for hypertensive disorders of pregnancy and Cesarean delivery. Potential fetal complications include fetal macrosomia which may result in neonatal hyperbilirubinemia and hypoglycemia. Infants of diabetic mothers are also at increased risk of operative delivery, shoulder dystocia, and birth trauma.[1]

The prevalence of both GDM and type 2 diabetes mellitus continue to increase in many racial/ethnic populations. The local prevalence of type 2 diabetes in Hawai'i is increasing especially among Asian and Pacific Islander groups which include Native Hawaiians. These groups have demonstrated significantly higher rates of impaired glucose tolerance (15.5%) and type 2 diabetes (20.4%) compared to the overall US population.[2] In light of the fact that GDM prevalence rates tend to vary in direct proportion to the prevalence of type 2 diabetes in other populations, this increase in type 2 diabetes in Asians and Pacific Islanders may correlate with the increasing number of pregnancies complicated by GDM.[2,3] A recent report of the prevalence of GDM in Hawai'i found that GDM rates were highest in Filipino women, followed by Chinese, Japanese, and Native Hawaiian/Pacific Islander women. Hawai'i Caucasians were found to have the lowest GDM rate of all ethnic groups.[4] These differences in GDM incidences are likely multi-factorial and are likely to include genetic factors.

Retinol binding protein 4 (RBP4) is the only specific transport protein for retinol (vitamin A) in the circulation. Circulating RBP4 is bound to transthyretin and binds to retinol to prevent its loss through the kidneys.[5] Until recently this has been its only known function, however RBP4 has been since shown to be one of many proteins produced in adipose tissue. These adipokines signal changes of adipose tissue energy status to other organs and consequently either enhance (eg, leptin) or impair (eg, tumor necrosis factor alpha and resistin) insulin secretion and action.[6-8] Increased RBP4 plasma levels have recently been shown to be associated with both pregestational diabetes[8,9] and gestational diabetes.[10] As illustrated in Figure 1, studies involving transgenic rodent models have suggested that RBP4 alters insulin sensitivity by both decreasing glucose uptake by muscle and increasing liver gluconeogenesis.[8]

The gene responsible for RBP4 is located on chromosome 10q and has been linked to an increased risk for type 2 diabetes in Caucasians[11] and Mexican Americans.[12] As displayed in Figure 2, specific single nucleotide polymorphisms (SNPs) on the RBP4 gene have since been shown to be both linked to serum RBP4 levels and type 2 diabetes.[13] This link between RBP4 and type 2 diabetes is intriguing since gestational diabetes has been strongly associated with the latter development of type 2 diabetes. The pregnant state, due to increased insulin resistance, is thought to unmask pre-clinical type 2 diabetes. In fact, more than half of the gestational diabetics will go on to develop type 2 diabetes mellitus.[14,15]

Consequently, in light of this potential link between RBP4 and GDM the team sought to determine whether a specific genetic polymorp,hism of the RBP4 gene was associated with GDM in Filipino and Pacific Islander groups in Hawai'i in addition to a Caucasian group from Utah.

Materials and Methods

Study Design

A case–control gene association study was performed comparing genotype frequencies of a single nucleotide polymorphism (SNP) mapping to the retinol binding protein 4 gene (rs3758539, -803 C>T) in healthy pregnant women and pregnant women with GDM.

Subjects

Ethical approval for the study was obtained from the Institutional Review Board (IRB) of the University of Hawai'i and Intermountain Healthcare in Utah. All participants provided written informed consent prior to providing any information or samples.

All pregnant women presenting to Labor and Delivery at Kapi'olani Medical Center for Women and Children in Hawai'i and Intermountain Healthcare in Utah were routinely screened for GDM at 24-28 weeks of gestation. Gestational age was determined by early ultrasound examination or mid trimester ultrasound consistent with the last menstrual period.

Blood was collected from women who met the Coustan-Carpenter criteria for GDM and ethnically matched non-diabetic controls. More

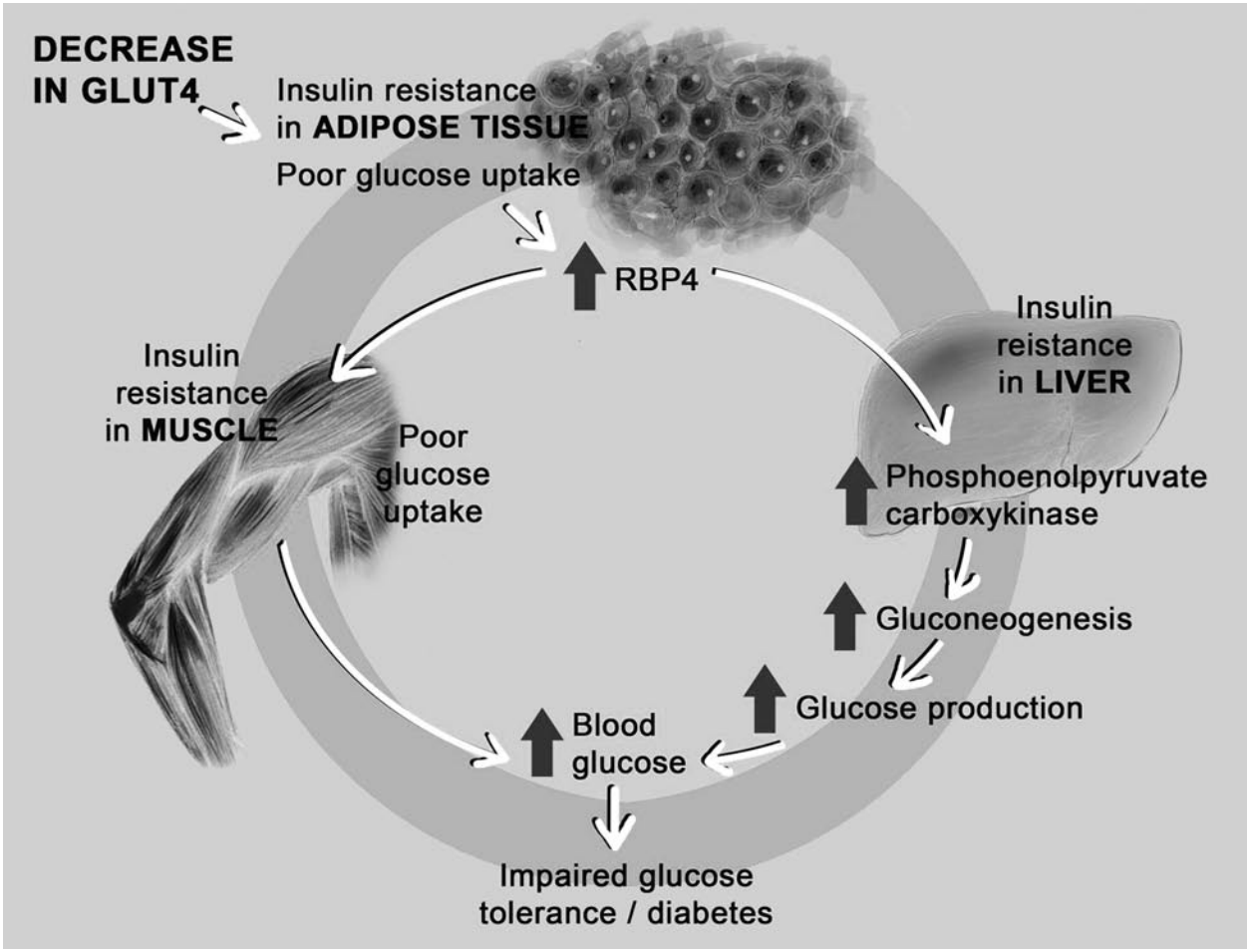

Figure 1. Proposed Role of Retinol Binding Protein in the Pathogenesis of Gestational Diabetes

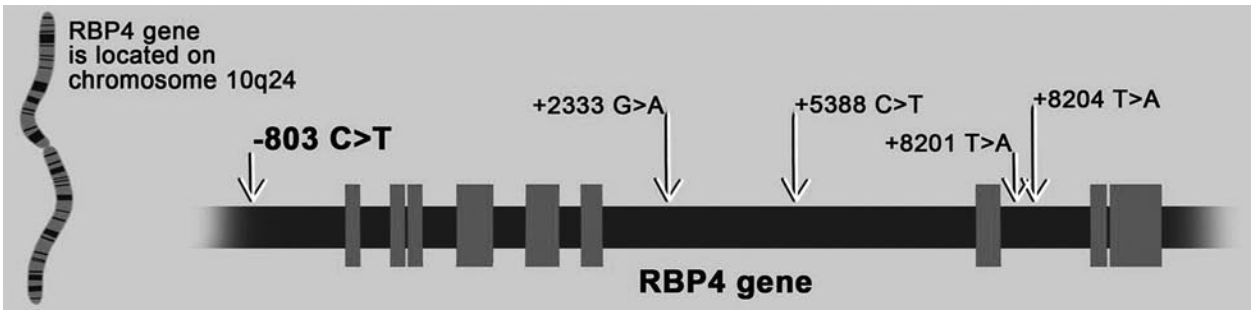

Figure 2. The Retional Binding Protein Gene

specifically, screening tests were performed at 24 to 28 weeks of gestation with a 1 hour 50g oral glucose challenge test. Individuals with venous glucose levels greater than 140 mg/dl underwent a 3-hour 100g oral glucose tolerance test in the morning after a 12 hour fast. Women who met or exceeded at least 2 of the following venous blood glucose levels were diagnosed as having GDM: fasting 90 mg/dl, 1-hour 180 mg/dl, 2-hour 155 mg/dl, and 3-hour 140 mg/dl.[14]

The GDM cohort consisted of 88 Utah Caucasian, 82 Hawai'i Filipino, and 19 Hawai'i Pacific Islander women. The control cohort consisted of 315 Utah Caucasian, 286 Hawai'i Filipino, and 32 Hawai'i Pacific Islander women with normal glucose tolerance. Information regarding phenotypic characteristics such as age, BMI and glucose levels were not accessible.

Genotyping

Genomic DNA was extracted from whole blood using the Autopure DNA isolation system (Gentra Systems, Minneapolis, MN) following the manufacturers protocol. The SNP was genotyped using the TaqMan 5'-exonuclease SNP allelic discrimination assay by means of an ABI 7900 HT thermocycler (Applied Biosystems, Foster City, CA). Negative controls were included across the plates to ensure accuracy of genotyping. Genotyping errors were excluded by duplicate genotyping. Call rates for the SNP exceeded 97%.

The polymerase chain reaction (PCR) was carried out in a total reaction volume of 5 µl containing 10 ng of DNA and using the following amplification protocol: denaturation at 95°C for 10 minutes, followed by 50 cycles of denaturation at 92°C for 15 seconds, and annealing and extension at 60°C for 60 seconds. Post-PCR, the genotype of each sample was automatically attributed by measuring the allele-specific fluorescence in the ABI Prism 7900 HT Sequence Detection Systems, using the SDS 2.3 software for allele discrimination (Applied Biosystems).

Statistical Analysis

Allele and genotype frequencies were counted manually and the distributions were assessed for deviations from the Hardy-Weinberg equilibrium with the χ^2 test for goodness of fit. Genotype and allele frequencies were compared by contingency table analysis using χ^2 tests (http://statpages.org/ctab2x2.html). $P<0.05$ via the Pearson uncorrected method were considered significant. The Fisher's Exact test was utilized to calculate significance for the Pacific Islander group due to the small sample size. Descriptive data are expressed as mean value +/- SD.

A power analysis was performed to determine the number of cases and controls required utilizing a genetics power calculator.[15] As stated before, GDM rates vary from 1-14% depending on the population studied.[1] Previous studies have noted the rs3758539 minor allele frequency to be 0.18 in Caucasians[16] and 0.12 in Asians (Mongolians).[13] Assuming a 10% GDM prevalence rate and a control : case ratio of 3.5, 267 controls/ 76 cases in the Caucasian cohort and 282 controls/ 80 cases in the Filipino cohort were necessary to achieve 80% power (B) at the $P=0.05$ significance level of detecting a genotypic relative risk of 2.0.

Results

The team genotyped a target SNP rs3758539 located 5' of exon 1 of the RBP4 gene. Genotype and allele frequencies in the controls and GDM cases were tested using chi-square contingency tests. Genotype frequencies were in Hardy-Weinberg equilibrium.

In light of the power calculations, the study achieved sufficient sample size to adequately power our Caucasian and Filipino cohorts. Tables 1, 2, and 3 display the genotypic and minor allele frequencies for all three study groups. These frequencies were consistent with previously reported data in the Caucasian cohort (17.4% cases, 15.3% controls). Minor allele frequencies in the Filipino cohort were 13.4% in the case group and 11.4% in the control group. This appears to be the first reported data regarding rs3758539 in Filipinos.

There was no significant allelic or genotypic association between rs3758539 and GDM in the Caucasian, Filipino, or Pacific Islander cohorts. Although the Filipino GDM cohort displayed an increased minor allele homozygous genotype frequency (3.7% vs 1.7%), the association was not found to be significant (P values >0.05).

Table 1. SNP rs3758539 and Caucasian Allele/Genotypic Frequencies

		Caucasian		
		GDM (n=88)	Controls (n=315)	*P* value
Genotype	CC	63.6%	72.4%	0.697
	TT	1.1%	3.2%	0.115
	CT	35.2%	24.4%	0.469
Allele	T	17.4%	15.3%	0.489

DNA nucleic acids: C=cytosine, T=thymine, A=adenine, G=guanine, CC=cytosine-cytosine, TT=thymine-thymine, CT=cytosine-thymine

Table 2. SNP rs3758539 and Filipino Allele/Genotypic Frequencies

		Filipino		
		GDM (n=82)	Controls (n=286)	*P* value
Genotype	CC	76.8%	79.0%	0.292
	TT	3.7%	1.7%	0.670
	CT	19.5%	19.2%	0.296
Allele	T	13.4%	11.4%	0.473

DNA nucleic acids: C=cytosine, T=thymine, A=adenine, G=guanine, CC=cytosine-cytosine, TT=thymine-thymine, CT=cytosine-thymine

Table 3. SNP rs3758539 and Pacific Islander Allele/Genotypic Frequencies

		Pacific Islander		
		GDM (n=19)	Controls (n=32)	*P* value
Genotype	CC	94.7%	71.9%	-
	TT	0%	0%	-
	CT	5.3%	28.1%	0.061
Allele	T	3%	14%	0.165

DNA nucleic acids: C=cytosine, T=thymine, A=adenine, G=guanine, CC=cytosine-cytosine, TT=thymine-thymine, CT=cytosine-thymine

Discussion

Recently data has supported the role of various adipokines such as visfatin, adiponectin, resistin, and RBP4 in type 2 diabetes.[6] RBP4 has specifically been associated with insulin resistance, obesity, type 2 diabetes, and GDM.[8,10,17-20]

Since type 2 diabetes and GDM are believed to share similar pathophysiology, this study sought to determine whether a correlation existed between a specific SNP of the RBP4 gene and GDM. As mentioned previously, the team chose to examine rs3758539 in the study population. This particular SNP has already been linked to type 2 diabetes in the Mongolian population. The minor allele was significantly associated with type 2 diabetes and the minor allele homozygotes were reported to be associated with higher levels of serum RBP4 in non-pregnant diabetics. The authors of that study determined that the SNP could modify gene transcription efficiency by affecting the binding of transcription factors in vitro.[13] In addition, a Chinese study found other non-coding RBP4 SNPs (+2333 G>A, +5388 C>T, +8201 T>A, and +8204 T>A) in linkage disequilibrium with rs3758539 to be significantly associated with circulating RBP4 levels in their population. These SNPs are displayed in Figure 2. The authors concluded that these SNPs may be genetic markers and that SNP rs3758539 played a functional role.[21]

Despite these findings, results did not show a significant association between our target SNP and GDM in any of the current study groups. There are possible methodological explanations for these results. First, due to insufficient numbers, the team pooled all Pacific Islanders (Native Hawaiian, Samoan, Micronesian, Tongan, etc.) into a single group. However, the pooled Pacific Islander group still did not reach a sufficient sample size to detect a significant association.

Ideally, with a larger sample size, each Pacific Islander ethnicity could be evaluated separately. Second, since this database was not specifically designed to study diabetes, this study had incomplete data regarding other possible covariates such as body mass index and body fat distribution.

However, despite these limitations, this study appears to be the first published report of rs3758539 allele frequencies in a Filipino population. This population is at increased risk for GDM, as is evident by their increased prevalence rates relative to other ethnic populations.[4] Establishing this baseline allele frequency rate may be helpful in designing future genetic research involving RBP4 in this population.

Interestingly, despite the apparent link between the RBP4 SNP rs3758539 and circulating RBP4 levels and insulin sensitivity, it was not found to be associated with GDM in the current study population. This study was adequately powered to detect an association in the Caucasian and Filipino groups. The absence of an association may suggest that GDM and type 2 diabetes may have more divergent molecular pathophysiology than previously suspected. However, larger studies are required to examine the association of RBP4 genetic variants in the other Asian and Pacific Islander populations.

Disclosure Statement

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References

1. ACOG Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists. Number 30, September 2001 (replaces Technical Bulletin Number 200, December 1994). Gestational diabetes. *Obstet Gynecol.* Sep 2001;98(3):525-538.
2. Grandinetti A, Chang HK, Mau MK, et al. Prevalence of glucose intolerance among Native Hawaiians in two rural communities. Native Hawaiian Health Research (NHHR) Project. *Diabetes Care.* Apr 1998;21(4):549-554.
3. Cockram CS. The epidemiology of diabetes mellitus in the Asia-Pacific region. *Hong Kong Med J.* Mar 2000;6(1):43-52.
4. Silva JK, Kaholokula JK, Ratner R, Mau M. Ethnic differences in perinatal outcome of gestational diabetes mellitus. *Diabetes Care.* Sep 2006;29(9):2058-2063.
5. Quadro L, Blaner WS, Salchow DJ, et al. Impaired retinal function and vitamin A availability in mice lacking retinol-binding protein. *EMBO J.* Sep 1 1999;18(17):4633-4644.
6. Muoio DM, Newgard CB. Metabolism: A is for adipokine. *Nature.* Jul 21 2005;436(7049):337-338.
7. Mora S, Pessin JE. An adipocentric view of signaling and intracellular trafficking. *Diabetes Metab Res Rev.* Sep-Oct 2002;18(5):345-356.
8. Yang Q, Graham TE, Mody N, et al. Serum retinol binding protein 4 contributes to insulin resistance in obesity and type 2 diabetes. *Nature.* Jul 21 2005;436(7049):356-362.
9. Cho YM, Youn BS, Lee H, et al. Plasma retinol-binding protein-4 concentrations are elevated in human subjects with impaired glucose tolerance and type 2 diabetes. *Diabetes Care.* Nov 2006;29(11):2457-2461.
10. Chan TF, Chen HS, Chen YC, et al. Increased serum retinol-binding protein 4 concentrations in women with gestational diabetes mellitus. *Reprod Sci.* Feb 2007;14(2):169-174.
11. Meigs JB, Panhuysen CI, Myers RH, Wilson PW, Cupples LA. A genome-wide scan for loci linked to plasma levels of glucose and HbA(1c) in a community-based sample of Caucasian pedigrees: The Framingham Offspring Study. *Diabetes.* Mar 2002;51(3):833-840.
12. Duggirala R, Blangero J, Almasy L, et al. Linkage of type 2 diabetes mellitus and of age at onset to a genetic location on chromosome 10q in Mexican Americans. *Am J Hum Genet.* Apr 1999;64(4):1127-1140.
13. Munkhtulga L, Nakayama K, Utsumi N, et al. Identification of a regulatory SNP in the retinol binding protein 4 gene associated with type 2 diabetes in Mongolia. *Hum Genet.* Feb 2007;120(6):879-888.
14. Coustan DR. Making the diagnosis of gestational diabetes mellitus. *Clin Obstet Gynecol.* Mar 2000;43(1):99-105.
15. Purcell S, Cherny SS, Sham PC. Genetic Power Calculator: design of linkage and association genetic mapping studies of complex traits. *Bioinformatics.* Jan 2003;19(1):149-150.
16. Craig RL, Chu WS, Elbein SC. Retinol binding protein 4 as a candidate gene for type 2 diabetes and prediabetic intermediate traits. *Mol Genet Metab.* Mar 2007;90(3):338-344.
17. Graham TE, Yang Q, Bluher M, et al. Retinol-binding protein 4 and insulin resistance in lean, obese, and diabetic subjects. *N Engl J Med.* Jun 15 2006;354(24):2552-2563.
18. Gavi S, Stuart LM, Kelly P, et al. Retinol-binding protein 4 is associated with insulin resistance and body fat distribution in nonobese subjects without type 2 diabetes. *J Clin Endocrinol Metab.* May 2007;92(5):1886-1890.
19. Janke J, Engeli S, Boschmann M, et al. Retinol-binding protein 4 in human obesity. *Diabetes.* Oct 2006;55(10):2805-2810.
20. Lee DC, Lee JW, Im JA. Association of serum retinol binding protein 4 and insulin resistance in apparently healthy adolescents. *Metabolism.* Mar 2007;56(3):327-331.
21. Hu C, Jia W, Zhang R, et al. Effect of RBP4 gene variants on circulating RBP4 concentration and type 2 diabetes in a Chinese population. *Diabet Med.* Jan 2008;25(1):11-18.

Komo mai kau mapuna hoe (1836). "Dip your paddle in."
Join in the effort.

Mary Kawena Pukui's 'Olelo No'eau: Hawaiian Proverbs & Poetical Sayings (Bishop Museum Press 1983)

The Challenges of Collecting Data on Race and Ethnicity in a Diverse, Multiethnic State

Bliss Kaneshiro MD, MPH; Olga Geling PhD; Kapuaola Gellert MPH; and Lynnae Millar MD

Abstract

Race and ethnicity are commonly used predictor variables in medical and public health research. Including these variables has helped researchers to describe the etiology of certain disease states. Including race and ethnicity in research has been hypothesis generating in terms of the relationship between genetic and environmental factors in the development of disease. Eliminating health disparities among different racial and ethnic groups has become a national priority. However, incorporating race and ethnicity into health research is complex because these variables are difficult to define and individuals often identify with more than one race or ethnicity. As a "minority-majority", multiethnic, multiracial state, Hawai'i faces unique challenges in incorporating race and ethnicity into research. As the demographics of the United States continue to evolve, many of the challenges faced in Hawai'i will apply to the United States as a whole.

Introduction

Health outcomes are the result of a complex interplay among genetically determined factors and socially mediated exposures. Because race and ethnicity are integral to both of these, they are almost always measured as potential predictor variables in medical and public health research. In some studies, race and ethnicity are the most important predictor variable for a particular outcome. From differences in the prevalence of diseases like Thalassemia, to differences in the prognosis of diseases like ovarian cancer, to the unequal utilization of health care resources, disparities among different racial and ethnic groups exist throughout the medical literature.[1-3] For example, the incidence of cystic fibrosis is reported to be one in 2000 for Caucasians but is only one in 15,300 for African Americans.[4] Black women have higher rates of unintended pregnancy (16.3%) than Hispanic (9.0%), non-Hispanic white (9.4%), and Asian (8.5%) women.[5] Native Hawaiian and Filipino women with breast cancer tend to be diagnosed at later stages of disease and have lower survival rates than other ethnic groups even after controlling for stage of disease.[6]

Hawai'i is considered to be unique because of its ethnic and racial diversity. It is one of a handful of "minority majority" states in which non-Hispanic whites do not form a majority of the population. Census data from 2010 indicates that 24.7% of individuals living in Hawai'i identified themselves as being white-alone, 38.6% identified themselves as Asian-alone and 10.0% identified themselves as Native Hawaiian- or Pacific Islander-alone.[7] It is also common for individuals in Hawai'i to identify with multiple races and ethnicities. Nearly one-quarter of respondents in the 2010 Census reported that they identified with more than one race.[7] In 2000, more than 60% of all babies born in Hawai'i were identified as being of mixed race or ethnicity.[8] In comparison, California, a state known for its racial diversity, reported that only 1.7% of mothers indicated more than one race on their child's birth certificate.[9] It is in this milieu that medical and public health research in Hawai'i is conducted. In this commentary, we will discuss the challenges we face in Hawai'i in incorporating race and ethnicity into medical and public health research. We suggest that these will be important concepts to incorporate into all areas of research given the increasing heterogeneity of the United States.

Why We Care

Incorporating race and ethnicity into research has been fruitful for medical and public health researchers. It has been hypothesis generating in terms of the etiology of disease and the interaction between genetic and environmental factors, For example, the incidence of breast cancer for women born in Japan is significantly lower than that of their counterparts, born in Hawai'i, California, and Washington state.[10] This has led to hypotheses about how lifestyle, particularly dietary factors, influences breast cancer risk.

The Healthy People 2010 initiative called for the reduction of racial and ethnic health disparities as a national health priority.[11] This highlights one of the most important reasons why race and ethnicity are studied in medical research. Disparities exist in health care outcomes among racial and ethnic groups in almost all fields of medicine. Sometimes these disparities are marked. However, even when they are subtle, they demonstrate which groups should be targeted for allocation of health care resources. Since different interventions can work in certain groups and not in others, identifying disparities helps in designing culturally appropriate interventions to improve health outcomes.

Current Categorization

Race and ethnicity do not have standard scientific definitions making these variables difficult to measure. Without a standard scientific definition, many question whether meaningful comparative research can be done when there is so much opportunity for misclassification.[2,12-14] Indeed, many highly-respected health researchers have advocated for the abandonment of race and ethnicity as legitimate scientific variables.[15,16] With this in mind, race is generally considered to be a biological construct based on observable physical characteristics including skin color or body habitus. Ethnicity has come to represent a social construct that could be defined as an individual's sense of culture.[17] Individuals in the same ethnic group often share linguistic, dietary, and religious traits and potentially share similar outlooks on health and health care.[18]

To categorize race and ethnicity, the US Office of Management and Budget uses a two-question format in which information on race is obtained using 5 categories (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White) and information on ethnicity is collected using 2 categories (Hispanic or Latino versus Not Hispanic or Latino).[19] This classification system has been used in both the US Census as well as all medical research that is funded by the National Institutes of Health.[20]

Multiracial and Multiethnic

In 1970, estimates from the United States Census indicated that there were only 500,000 multiracial individuals living in the United

States. By 1990, this number had increased to nearly 2 million.[21] In the 2000 census, 2.4% of the population, roughly equivalent to 6.8 million people, were identified as multiracial.[22] Multiracial individuals will continue to factor more prominently into the demographics of the United States as a whole.[8] Based on current estimates, by the year 2050, 21% of the United States population will identify with multiple races.[23]

Although groupings of DNA sequences called Single Nucleotide Polymorphisms (SNPs) hold some eventual promise of objectively quantifying race,[24-26] data on both race and ethnicity are most accurately obtained using self-identification. In addition, it is important for categories to be meaningful to the outcome in question and to the respondents in the sample.[27] In Hawai'i, it is practical to differentiate Native Hawaiians from other Pacific Islanders because of factors that have historically affected this indigenous group. Other groups such as Micronesians are small in number in terms of overall population. While they could be easily incorporated in the Pacific Islander category, in some instances it is important to consider this group separately as they are uniquely affected by recent emigration status, infectious disease burden, and exposure to ionizing radiation from US nuclear weapons testing.[28]

The categories of race and ethnicity defined by the US Office of Management and Budget usually do not adequately reflect the multiethnic and multiracial population in Hawai'i. Thus, medical and public health researchers have utilized different methodologies in an attempt to more accurately delineate race and ethnicity in this group. One technique involves providing individuals with a comprehensive list of race and ethnicity choices as well as a "refused" and "don't know" category. In one question, individuals are allowed to select all of the races and ethnicities that apply to them. Individuals with multiple races and ethnicities can thereby select more than one race or ethnicity. In a second question, individuals are asked to select the race or ethnicity that they most identify with. Depending on the medical or public health question being studied, different analysis can draw on what is most meaningful to the particular outcome.

US Census data shows that allowing multiracial individuals to select more than one race can result in marked differences in the resulting statistics. In the 1990 census, when individuals were allowed to select only a single race, census data showed there were nearly 2 million American Indians living in the United States. In 2000, when respondents were allowed to select more than one race, 4.2 million individuals reported they were either American Indian alone or in combination with another race. This corresponded to an increase of 110 percent.[29] A similar increase was seen for Native Hawaiians. In 1990, approximately 139,000 individuals living in Hawai'i were Native Hawaiian. In 2000, there were 282,000 people reporting that they were Native Hawaiian alone or in combination with another race.[30,31]

The Hawai'i Health Survey, a continuous statewide household survey conducted by the Department of Health, uses a similar though slightly different approach to race and ethnicity.[32,33] Respondents are given a list of races and ethnicities and can select four categories from a list of 20 (including refused, "I don't know," and other) for their mother and their father. This results in up to eight indicators of ethnicity for the respondent. Multiethnic, multiracial respondents are then assigned to a single ethnic category by means of an algorithm determined by the Office of Health Status Monitoring. Specifically, if Native Hawaiian is listed as an ethnicity for either the mother or father, the individual is categorized as Native Hawaiian. Otherwise, the person is considered to be the first non-Caucasian ethnicity listed for the father. If the first listed ethnicity for the father is Caucasian or unknown then the individual is considered to be the first non-Caucasian ethnicity listed for the mother. Use of this algorithm increased reporting in the Native Hawaiian group. Statistics derived from this technique are considered more accurate measures of the overall number of Native Hawaiians living in Hawai'i. For example, a larger number of Native Hawaiians were reported in the Hawai'i Health Survey than in the 1990 census. However, one can see the shortcomings of using an algorithm rather than self-identification as it assumes the importance of ethnicity for multiethnic and multiracial individuals.

In the "blend methodology", which has also been used in Hawai'i, the ethnicity of the individual is determined by ascertaining the ethnicity of the individual's parents and grandparents and deriving a percentage.[34] For individuals with many different races or ethnicities, asking about a specific person in their family, may initiate more detailed thinking about race and ethnicity. In the blend methodology, ethnicity can be used as a categorical or as a continuous variable in which the proportion of a given ethnicity is incorporated into the analysis. Using a similar methodology, our group ascertained that of nearly 6,000 babies born at a medical center in Hawai'i between 2007 and 2010, 11.6% had 5 or more racial or ethnic groups.[35]

In terms of the multiracial, multiethnic group, there are many unanswered questions. Are there common or shared experiences for multiracial or multiethnic individuals beyond living in a relatively mono-racial society? While the psychiatric literature historically described a kind of "double rejection" among multiracial individuals which included disapproval from both communities,[36,37] it is unclear whether these experiences still apply or whether this will change as the United States becomes more diverse. In recent studies, the multiethnic, multiracial group was identified as having different prevalence of various health outcomes that range from diabetes to low birth weight.[38, 39] A study from 1996 showed that individuals who were full Native Hawaiian had more than double the age-standardized mortality as part Native Hawaiians.[40]

Many social and societal factors can influence how multiethnic, multiracial individuals identify their own race and ethnicity. Studies have demonstrated that multiracial and multiethnic individuals tend to report fewer races and ethnicities as they get older.[41] The boundaries of race and ethnicity can also depend on how questions are asked, the context in which they are being asked, and how the answer will be used. Situational ethnicity refers to identifying with a particular ethnicity within specific contexts.[42] Factors that can influence what an individual identifies with include where one lives and the perceived loss or benefit that could result from one's answer. The acceptance or denial of a certain culture, belief system, religion, or even a particular family member as well as phenotypic appearance can also play a role in self-identification.

Additionally, individuals may not know their racial or ethnic background. Individuals may be multiracial but may not report it because they do not know about a detailed family history from generations past. This is especially true in places like the United States which has a history of institutionalized racism. Literature from the 1930s includes descriptions of Native Hawaiians as "indolent," "in

need of constant supervision," and "deceptive".[43] This is believed to have prompted many individuals to report they were a different race rather than suffer discrimination.

In Hawai'i, certain groups, particularly those that are smaller in overall number such as the Native Hawaiian group, are commonly multiracial and multiethnic. A study done by the Office of Hawaiian Affairs estimated in 1984 that of the 200,000 Native Hawaiians living in Hawai'i, 8,000 had a "100% Hawaiian blood quantum."[44] As the indigenous race, however, there is substantial cultural awareness and many Native Hawaiians may primarily identify with this ethnicity when asked. Thus, in the 2000 Census, more than 80,000 individuals reported themselves as only Native Hawaiian.[30] With this type of cultural identification, that could play a role in lifestyle and health care outcomes, it is typically more useful to group multiracial individuals who are part Native Hawaiian in the Native Hawaiian category than in an overarching multiracial category.

Immigration and Assimilation

The relationship between ethnicity and health outcomes is influenced by acculturation and assimilation, which may manifest as changes in language, food preferences, social activities, and religious identification. In some cases, a higher degree of acculturation is accompanied by poorer health outcomes, including obesity and obesity related illness.[45-47] For many ethnic groups, differences in health care beliefs and practices have been anecdotally noted among different generations. For example, first generation Chinese Americans have been described as incorporating a family centered decision making process into health care while later generations may take a more individualistic approach.[48]

The phenomena of immigration and assimilation can make studying race and ethnicity difficult. In 1998, 10% of the population in the United States, the equivalent of 26.3 million people, were born in another country.[23] Access to health care and health care outcomes for these individuals can be different than that of individuals whose families have been residing in the United States for generations. For example, recent immigrants from China may have divergent health care needs than Chinese Americans whose families may have been residing in Hawai'i since the 1800s. Yet, they would all fall under the same ethnic category. This can hide important disparities that affect one group and not the other.

Other Challenges

Ethnic minorities are often small in number making it challenging to find representative samples and adequate sample sizes. To overcome this, researchers frequently aggregate different racial and ethnic groups together. The Asian group encompasses a large number of races and ethnicities including Chinese, Filipino, Laotian, Hmong, Korean, Japanese, and Vietnamese among others. Considering these genetically and culturally different groups together can introduce substantial error and bias into study design. In real terms, it is unclear whether the Asian racial/ethnic group exists as a self-identity or as an identity for the US public as a whole.[34] Further complicating the issue is the Native Hawaiian and Pacific Islander category that often gets lumped together with Asians into an Asian/Pacific Islander/Native Hawaiian group. In data analysis, the Native Hawaiian and the Pacific Islander group typically gets numerically overwhelmed when it is combined with the Asian group. Although aggregation can increase sample size, if the groupings are not meaningful, it detracts from the analysis and its applicability.

While there are genetic diseases that predominate in certain racial groups, in most instances, race should be used as the primary determinant variable with caution. More often, race is a proxy for the socioeconomic and demographic variables that are associated with disease but race itself is not usually the cause of the disease. For example, an increased risk of substance abuse and sexually transmitted infections has been associated with race in several studies.[49,50] However, when socioeconomic and environmental information are incorporated into the analysis, race is no longer a significant variable.[51] In analyses where race is serving as a proxy for socioeconomic or demographic factors, particularly for outcomes that involve health behaviors, it is more accurate to report that factor as the primary determinant of health rather than the corresponding race or ethnicity. Care must be taken to collect comprehensive cultural and economic information on study participants to allow for detailed analysis of potential confounding variables. While disparities on race and ethnicity should be reported, if the hypothesized relationship between race or ethnicity and the health outcome exists because of confounding factors such as socioeconomic status, this should be apparent.

Conclusion

Race has been a defining issue in the social and political history of the United States. Research that has incorporated race and ethnicity has led to a significant increase in our understanding of the factors that affect disease and health. The demographics of the United States continue to change. Four states, Hawai'i, California, Texas and New Mexico have been "majority-minority" states since 2005.[52] Based on current estimates, by the year 2050, the United States as a whole will have a "majority-minority."[53]

Just as the demographics of this country continues to change, the way in which we collect information on race and ethnicity represents a continual metamorphosis and it is likely that the classification systems we use will become more complex as the world becomes more integrated. We should continue to explore how to capture the concepts of race and ethnicity, drawing in the important biologic, cultural and social factors that need to be examined and utilizing other explanatory variables when they more precisely play a role in etiology.

Disclosure Statement

The authors do not have any relevant financial relationships to disclose.

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References

1. Albain KS, Unger JM, Crowley JJ, Coltman CA, Jr., Hershman DL. Racial disparities in cancer survival among randomized clinical trials patients of the Southwest Oncology Group. *J Natl Cancer Inst.* 2009,14:984-992.

2. Schulman KA, Rubenstein LE, Chesley FD, Eisenberg JM. The roles of race and socioeconomic factors in health services research. *Health Serv Res.* 1995,1 Pt 2:179-195.
3. Correlation between genotype and phenotype in patients with cystic fibrosis. The Cystic Fibrosis Genotype-Phenotype Consortium. *N Engl J Med.* 1993,18:1308-1313.
4. Macek M, Jr., Mackova A, Hamosh A, et al. Identification of common cystic fibrosis mutations in African-Americans with cystic fibrosis increases the detection rate to 75%. *Am J Hum Genet.* 1997,5:1122-1127.
5. Use of Contraception in the United States: 1982-2008. Vital and Health Statistics 23(29) [2010; http://www.cdc.gov/nchs/data/series/sr_23/sr23_029.pdf. Accessed October 22, 2010, 2010.
6. Braun KL, Fong M, Gotay C, Pagano IS, Chong C. Ethnicity and breast cancer in Hawaii: increased survival but continued disparity. *Ethn Dis.* 2005,3:453-460.
7. United States Census 2010. United States Census 2010 [2010; http://2010.census.gov/2010census/data/. Accessed May 17, 2011, 2011.
8. The State of Hawaii. 2001; http://hawaii.gov/dbedt/info/census/population-estimate. Accessed June 14, 2010, 2009.
9. Heck KE, Parker JD, McKendry CJ, Schoendorf KC. Multiple-race mothers on the California birth certificate, 2000. *Ethn Dis.* 2001,4:626-632.
10. Stanford JL, Herrinton LJ, Schwartz SM, Weiss NS. Breast cancer incidence in Asian migrants to the United States and their descendants. *Epidemiology.* 1995,2:181-183.
11. Healthy People 2010. Paper presented at: Healthy People 20102000; Washington, D.C.
12. Lin SS, Kelsey JL. Use of race and ethnicity in epidemiologic research: concepts, methodological issues, and suggestions for research. *Epidemiol Rev.* 2000,2:187-202.
13. Fullilove MT. Comment: abandoning "race" as a variable in public health research--an idea whose time has come. *Am J Public Health.* 1998,9:1297-1298.
14. Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity. 1997; http://www.whitehouse.gov/omb/rewrite/fedreg/ombdir15.html. Accessed July 4, 2009.
15. Lee SS, Mountain J, Koenig BA. The meanings of "race" in the new genomics: implications for health disparities research. *Yale J Health Policy Law Ethics.* 2001:33-75.
16. Cooper RS, Kaufman JS, Ward R. Race and genomics. *N Engl J Med.* 2003,12:1166-1170.
17. Cooper RS. A case study in the use of race and ethnicity in public health surveillance. *Public Health Rep.* 1994,1:46-52.
18. Eriksen TH. Small places, large issues : an introduction to social and cultural anthropology. 2nd ed. Sterling, Va.: Pluto Press; 2001.
19. Standards for the Classification of Federal Data on Race and Ethnicity. 1995; http://www.whitehouse.gov/omb/fedreg/race-ethnicity.html. Accessed June 25, 2009, 2009.
20. NIH Policy and Guidelines on The Inclusion of Women and Minorities as Subjects in Clinical Research – Amended, October, 2001. 2001; http://grants.nih.gov/grants/funding/women_min/guidelines_amended_10_2001.htm.
21. Findings on Questions on Race and Hispanic Origin Tested in the 1996 National Content Survey. 1996; http://www.census.gov/population/www/documentation/twps0016/twps0016.html. Accessed July 4, 2009.
22. Census Scope. 2000; http://www.censusscope.org/us/chart_multi.html. Accessed July 4, 2009.
23. Waters MC. Immigration, intermarriage, and the challenges of measuring racial/ethnic identities. *Am J Public Health.* 2000,11:1735-1737.
24. Nassir R, Kosoy R, Tian C, et al. An ancestry informative marker set for determining continental origin: validation and extension using human genome diversity panels. *BMC Genet.* 2009,1:39.
25. Tian C, Gregersen PK, Seldin MF. Accounting for ancestry: population substructure and genome-wide association studies. *Hum Mol Genet.* 2008,R2:R143-150.
26. Wang H, Haiman CA, Kolonel LN, et al. Self-reported ethnicity, genetic structure and the impact of population stratification in a multiethnic study. *Hum Genet.* 2010.
27. Hahn RA, Stroup DF. Race and ethnicity in public health surveillance: criteria for the scientific use of social categories. *Public Health Rep.* 1994,1:7-15.
28. Pobutsky AM, Buenconsejo-Lum L, Chow C, Palafox N. Micronesian migrants in Hawaii: Health issues and culturally appropriate, community-based solutions. *Californian Journal of Health Promotion* 2005,4:59-72.
29. The American Indian and Alaska Native Population: 2000. 2000; http://www.census.gov/prod/2002pubs/c2kbr01-15.pdf. Accessed March 14, 2011, 2011.
30. Profile of General Demographic Characteristics: 2000. 2000; http://factfinder.census.gov/servlet/QTTable?_bm=y&-geo_id=04000US15&-qr_name=DEC_2000_SF1_U_DP1&-ds_name=DEC_2000_SF1_U. Accessed March 14, 2011, 2011.
31. US Census Bureau American FactFinder. 1990; http://factfinder.census.gov/servlet/DTTable?_bm=y&-context=dt&-ds_name=DEC_1990_STF1_&-mt_name=DEC_1990_STF1_P006&-mt_name=DEC_1990_STF1_P007&-CONTEXT=dt&-tree_id=4001&-redoLog=true&-all_geo_types=N&-geo_id=04000US15&-search_results=01000US&-format=&-_lang=en. Accessed March 14, 2011, 2011.
32. Hawaii Health Survey HHS Introduction 2002. 2002; http://hawaii.gov/health/statistics/hhs/hhs_02/hhs02doc.pdf. Accessed March 14, 2011, 2011.
33. Data on Health and Well-being of American Indians, Alaska Natives, and Other Native Americans Data Catalog 2006; http://aspe.hhs.gov/hsp/06/catalog-ai-an-na/index.htm. Accessed March 14, 2011, 2011.
34. Novotny R, Daida YG. Blended ethnicity and health. *Hawaii Journal of Public Health.* 2009,1:1-9.
35. Millar L. Pacific Research Center for Early Human Development Database Honolulu: University of Hawaii; 2010.
36. Choi Y, Harachi TW, Gillmore MR, Catalano RF. Are multiracial adolescents at greater risk? Comparisons of rates, patterns, and correlates of substance use and violence between monoracial and multiracial adolescents. *Am J Orthopsychiatry.* 2006,1:86-97.
37. Gibbs JT. Identity and marginality: issues in the treatment of biracial adolescents. *Am J Orthopsychiatry.* 1987,2:265-278.
38. Schempf AH, Mendola P, Hamilton BE, Hayes DK, Makuc DM. Perinatal outcomes for Asian, Native Hawaiian, and other Pacific Islander mothers of single and multiple race/ethnicity: California and Hawaii, 2003-2005. *Am J Public Health.* 5:877-887.
39. Patrick SL, Kadohiro JK, Waxman SH, et al. IDDM incidence in a multiracial population. The Hawaii IDDM Registry, 1980-1990. *Diabetes Care.* 1997,6:983-987.
40. Braun KL, Yang H, Look MA, Onaka AT, Horiuchi BY. Age-Specific Native Hawaiian Mortality: A Comparison of Full, Part, and Non-Hawaiians. *Asian Am Pac Isl J Health.* 1996,4:352-362.
41. Waters MC. Ethnic Options: Choosing Identities in America. Berkeley: University of California Press; 1990.
42. Mays VM, Ponce NA, Washington DL, Cochran SD. Classification of race and ethnicity: implications for public health. *Annu Rev Public Health.* 2003:83-110.
43. McCubbin LD, Marsella A. Native Hawaiians and psychology: the cultural and historical context of indigenous ways of knowing. *Cultur Divers Ethnic Minor Psychol.* 2009,4:374-387.
44. Distribution of the Native Hawaiian population in Hawai'i by blood quantum: 1984. . Office of Hawaiian Affairs [1986; http://www.oha.org/databook/databook1996_1998/tab1-14.98.html. Accessed June 16, 2010, 2010.
45. Park J, Myers D, Kao D, Min S. Immigrant obesity and unhealthy assimilation: alternative estimates of convergence or divergence, 1995-2005. *Soc Sci Med.* 2009,11:1625-1633.
46. Huang B, Rodriguez BL, Burchfiel CM, Chyou PH, Curb JD, Yano K. Acculturation and prevalence of diabetes among Japanese-American men in Hawaii. *Am J Epidemiol.* 1996,7:674-681.
47. Novotny R, Williams AE, Vinoya AC, Oshiro CE, Vogt TM. US acculturation, food intake, and obesity among Asian-Pacific hotel workers. *J Am Diet Assoc.* 2009,10:1712-1718.
48. Brugge D, Kole A, Lu W, Must A. Susceptibility of elderly Asian immigrants to persuasion with respect to participation in research. *J Immigr Health.* 2005,2:93-101.
49. Ryan GM, Jr., Abdella TN, McNeeley SG, Baselski VS, Drummond DE. Chlamydia trachomatis infection in pregnancy and effect of treatment on outcome. *Am J Obstet Gynecol.* 1990,1:34-39.
50. Moscicki B, Shafer MA, Millstein SG, Irwin CE, Jr., Schachter J. The use and limitations of endocervical Gram stains and mucopurulent cervicitis as predictors for Chlamydia trachomatis in female adolescents. *Am J Obstet Gynecol.* 1987,1:65-71.
51. Lillie-Blanton M, Anthony JC, Schuster CR. Probing the meaning of racial/ethnic group comparisons in crack cocaine smoking. *JAMA.* 1993,8:993-997.
52. Bernstein R. Census Bureau Releases State and County Data Depicting Nation's Population Ahead of 2010 Census. 2009; http://www.census.gov/Press-Release/www/releases/archives/population/013734.html. Accessed July 4, 2009.
53. McKinney N, Bennet C. Issues regarding data on race and ethnicity: the Census Bureau experience. *Public Health Rep.* 1994,109:16-25.

Ka manu kahea i ka waʻa e holo (1478). "The bird that calls the canoe to sail." Said of the kioea (bristle-thighed curlew), whose early morning call was often a signal to canoes to go fishing or traveling.

Mary Kawena Pukui's ʻOlelo Noʻeau: Hawaiian Proverbs & Poetical Sayings (Bishop Museum Press 1983)

Student-written Simulation Scenarios: A Novel Cognitive Assessment Method In a Trauma Curriculum

Susan K. Steinemann MD, FACS; Benjamin W. Berg MD, FACP; Joseph W. Turban MD; Kristine M. Hara RRT; and Larry R. Alfrey PA

Abstract

Introduction: Global cognitive and psychomotor assessment in simulation based curricula is complex. We describe assessment of novices' cognitive skills in a trauma curriculum using a simulation aligned facilitated discovery method.

Methods: Third-year medical students in a surgery clerkship completed two student-written simulation scenarios (SWSS) as an assessment method in a trauma curriculum employing high fidelity human patient simulators (manikins). SWSS consisted of written physiologic parameters, intervention responses, a performance evaluation form, and a critical interventions checklist.

Results: Seventy-one students participated. SWSS scores were compared to multiple choice test (MCQ), checklist-graded solo performance in a trauma scenario (STS), and clerkship summative evaluation grades. The SWSS appeared to be slightly better than STS in discriminating between Honors and non-Honors students, although the mean scores of Honors and non-Honors students on SWSS, STS, or MCQ were not significantly different. SWSS exhibited good equivalent form reliability (r=0.88), and higher interrater reliability versus STS (r=0.93 vs r=0.79).

Conclusion: SWSS is a promising assessment method for simulation based curricula.

Introduction

Care of the injured patient is an essential knowledge area for graduating medical students.[1] Medical student education in trauma resuscitation has several inherent challenges. Students must learn and apply both cognitive and psychomotor skills; perceived patient risk limits novice participation in direct patient care interventions; and finally, the majority of trauma education must take place within the time constraints of the surgical clerkship. Simulation based training with high-fidelity human patient simulators (manikins) have become a popular tool for teaching and assessing skills in trauma resuscitation.[2-5] Manikin use in this context has several advantages: Integration of cognitive and psychomotor skills performance in rapid, reproducible scenarios; education in a supportive setting that eliminates patient risk; and consistent content for formative and summative assessment. Surgical residents who practiced with manikins demonstrated improved trauma assessment test scores compared to training with traditional moulage patients.[6] Simulation based training in undergraduate surgical curriculum, when compared to case-based lecture, has resulted in improvement on objective structured clinical examinations.[7]

Despite enthusiasm for the use of manikins, optimal methods for assessing educational outcomes have not been established, and few studies validate performance evaluation methods for simulation based training. Global rating scales and checklists are widely utilized, but continue to have variable internal reliability and correlation with other educational outcome standards.[8]

The authors instituted a simulation based trauma resuscitation curriculum designed to allow the student a learner-centered, self-paced method of assimilating content. We sought to design and evaluate a summative cognitive assessment method administered over a prolonged interval, allowing for reflection and incorporating principles of inductive learning.[9] This method, the student-written simulation scenarios (SWSS), was designed to be less subject to student performance anxiety, to incur less rater variability, and to avoid bias against students with less mature psychomotor development. We hypothesized that student assessment based upon SWSS creation might produce scores that are more reliable than summative assessment of observed performance in a simulation scenario (STS). Further, we sought to evaluate the association between multiple summative assessment methods: simulation resuscitation scenario performance (STS), multiple choice question test (MCQ), and SWSS, with the "gold standard" of global clinical performance assessment.

Methods

All third-year medical students at the University of Hawaii, John A. Burns School of Medicine (JABSOM) enrolled in a 7-week surgery clerkship from January 2007 to June 2008 consented to participate in this study, which was approved by the University of Hawaii's Committee on Human Studies. Students were required to complete the trauma curriculum as one element of their surgical clerkship. This curriculum included (a) assigned reading of the American College of Surgeons Committee on Trauma TEAM booklet;[10] (b) 90-minute lecture by a trauma surgeon on TEAM core content; (c) clinical experience in trauma patient management; and (d) a 3-hour, hands-on, demonstration and practice session with simulator based trauma resuscitation. This session was conducted in small groups (2-4 students) on manikins (SimMan, Laerdal Medical Corporation, Wappingers Falls, NY) and included assessment and treatment of simulated trauma patients. During the weeks following the simulation session, the students received individualized mentored instruction in developing simulated case scenarios, and were asked to author two 10-minute simulation cases (SWSS) incorporating the key principles of trauma resuscitation taught in lecture and simulation lab. Students were instructed to select two different traumatic shock states to describe in the SWSS exercise. Tension pneumothorax, hemorrhagic shock, and pericardial tamponade were suggested as possible SWSS options. The SWSS consists of a flow sheet of physiologic parameters and response to interventions (Figure 1), and a 15-point checklist designed to evaluate a learner's performance in the simulation scenario (Figure 2).

Students received one overall grade at the end of the clerkship (Honors, Credit, or Incomplete/No Credit) based primarily upon the subjective evaluation by the residents and attending surgeons, of their knowledge and clinical performance, the standard method for this clerkship. Specific trauma knowledge was assessed by three additional methods: (1) the standard multiple choice, 20-question TEAM written examination (MCQ), (2) solo performance in a

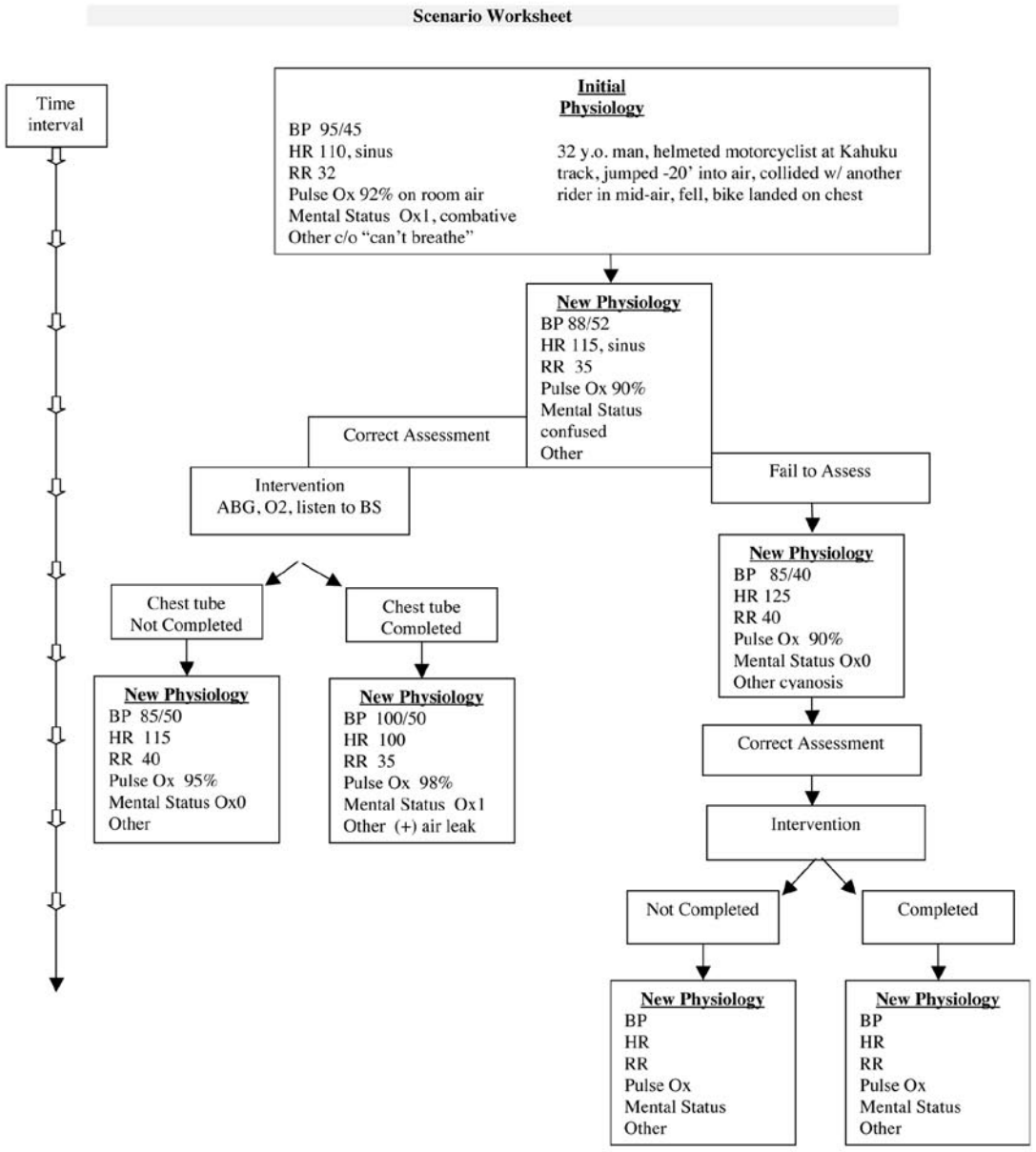

Figure1. Sample Flow Sheet for the Student-written Simulation Scenario (SWSS)

Figure 2. Checklist to be Completed as Part of the Student-written Simulation Scenario (SWSS).

MS3 Surgical Clerkship Scenario Planning Form Prioritized Checklist
Based upon best practice guidelines and principles, the Trainee participating in your scenario will be evaluated against these Prioritized Performance Goals that you list from most important (1) to least important (15):

	Prioritized Goals (#1 is most important)	✓ if achieved	Comments
1	Maintain in-line cervical spine stabilization		
2	Orotracheal intubation		
3	Listen for bilateral equal breath sounds		
4	Place left chest tube		
5	Obtain arterial blood gas		
6....15			

simulated trauma scenario (STS), and (3) grading of the SWSS. Students were advised that their performance in these three trauma assessment areas would be graded and considered (weight of 5%) in their end-clerkship grade. Evaluations of the students in the simulated trauma scenario and the SWSS were done independently by three trauma practitioners (the trauma simulation faculty) who did not contribute to the students' end-clerkship clinical evaluation.

Solo performance in a simulated trauma scenario (STS) was assessed during the penultimate week of the clerkship. Students were required to act as the primary trauma surgeon in a 10-minute resuscitation scenario. Students were videotaped, and three independent assessment scores (range 0-21) of the STS were generated by the trauma simulation faculty using a binary checklist, based upon the "ABCDE" tasks of trauma assessment. (Figure 2) Likewise,

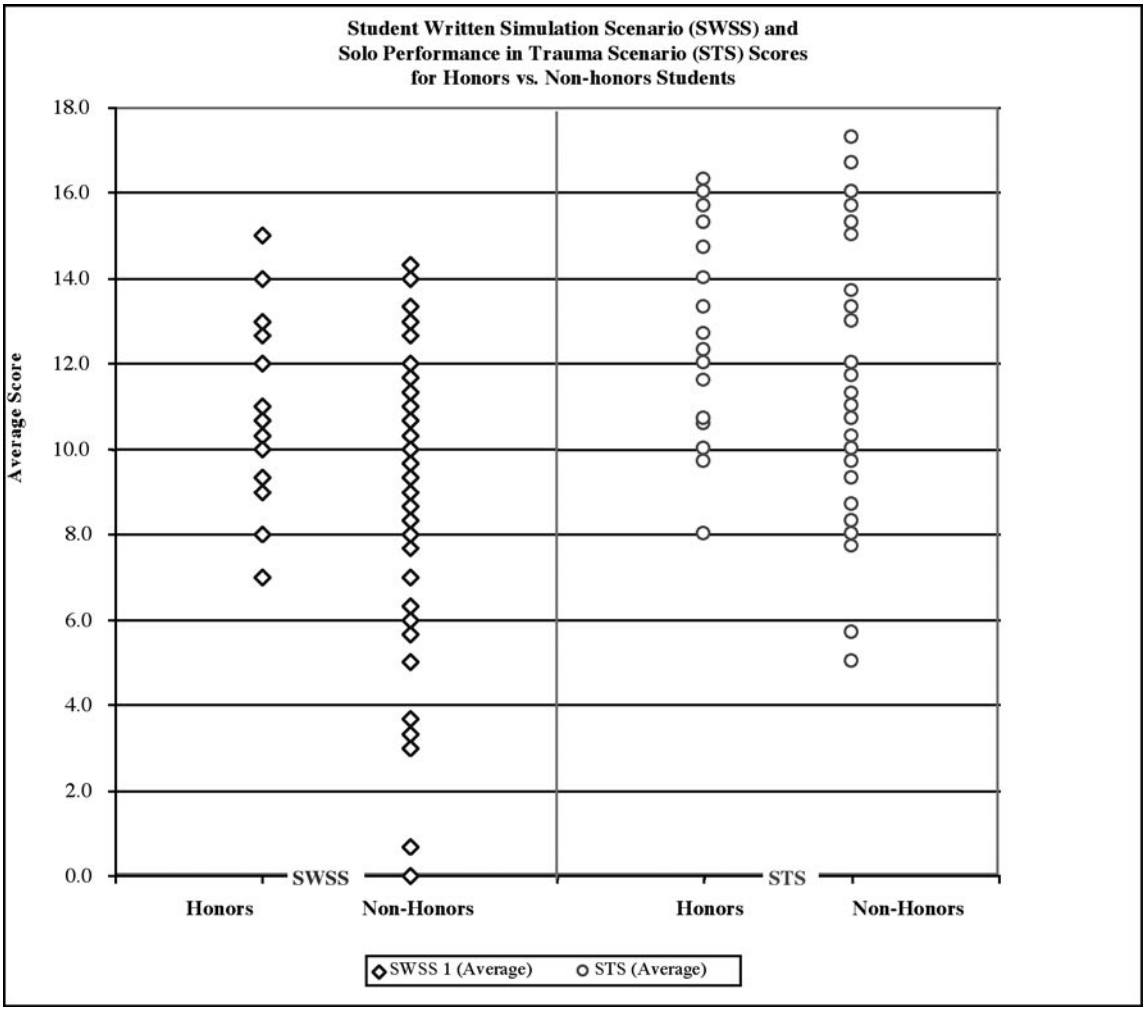

Figure 3. Individual Scores for Honors vs. Non-honors Students Exhibit Less Overlap for the Student-written Simulation Scenarios (SWSS) than for Solo Performance in a Simulated Trauma Scenario (STS).

grading of the SWSS was done independently by three reviewers. Faculty reviewers are all clinicians trained in Advanced Trauma Life Support, active in medical student education and evaluation, and cumulatively have over 65 years of clinical experience in trauma resuscitation. SWSS scores (range 0-15) were based upon key areas covered in the 15-point SWSS checklist, as well as content validity of the flow sheet, ie, the accuracy and completeness of the scenario in illustrating the key physiology and fundamental steps of trauma resuscitation. At the end of the assessment, students completed an attitudinal survey about their perception of the value of the components of the trauma curriculum.

Data were analyzed by a biostatistician. Interobserver reliability of test scores for SWSS and STS was determined by Intraclass Correlation Coefficient. Equivalent forms reliability was determined using Pearson's correlation. The mean difference between the two SWSS scores was also evaluated using a two-tailed paired t-test. Mean scores in the three trauma assessment areas (SWSS, STS, MCQ) were compared for students earning final clerkship grades of Honors versus non-Honors students using two-tailed two-sample t-tests. Logistic regression was used to measure any association between the assessment scores and the likelihood of a student having an Honors or a non-Honors grade. Significance was determined at $P < .05$.

Results

Seventy-three students were enrolled in the study, two students initially enrolled did not complete the clerkship for reasons unrelated to the trauma curriculum, and thus 71 students completed all phases of the curriculum and testing. Due to poor video recording, two of these students could not have interobserver reliability determined for their solo simulation performance session (STS). Nineteen students earned Honors in the clerkship, 48 received Credit, and 4 were Incomplete/No Credit. In no instance did a student's scores in the trauma curriculum alter the grade determined by their overall clinical performance on the surgery rotation.

Equivalent forms reliability for the two SWSS was high ($r = 0.88$) and the 95% confidence interval for the mean difference between the two mean SWSS scores was (-0.49, 0.25) indicating that on average there is no significant difference between the scores of the two SWSS for each student. The interobserver reliability for SWSS was also very high ($r = 0.98$), showing close agreement between graders of the SWSS. The interobserver reliability was higher for the SWSS than for performance on the simulated trauma scenario (STS, $r = 0.92$), despite the use of a simple, binary checklist to score the STS.

When compared to the "gold standard" of clinical assessment by surgeons (chief residents and attendings), the SWSS appeared better than STS in discriminating between Honors and non-Honors students (Figure 3). Although in this small sample of students, the difference between the mean SWSS scores of the Honors versus non-Honors students was not statistically significant, stepwise logistic regression analysis demonstrated a lower *P*-value (P=0.06) for the SWSS score than for the STS score (P=0.1). This indicates a higher probability of association with an Honors grade for students performing well on the SWSS than for the STS.

While designed primarily as an assessment method, students reported that they valued the SWSS as a learning method as well. 38% of students preferred the SWSS to the TEAM lecture as an educational method.

Discussion

The rapidly expanding use of simulation in surgical education has outpaced the development of supportive curricula. With any educational method it is imperative that the assessment method be reliable, valid, and relevant to the realm of actual clinical performance. Kneebone states, "Ideal simulation-based learning environments should provide a supportive, motivational, and learner-centered milieu which is conducive to learning."[11] Optimally, assessment methods for simulation based training should reflect this learner-centered philosophy, and should creatively employ the construct of simulation technology. Our traditional methods of performance assessment: Multiple-choice written examination, and evaluation of individual global performance in a brief, stressful simulated trauma scenario, fell short of this ideal.

Evaluation methods in simulation based training have typically focused on task completion rates, critical time to task performance on a simulator or standardized patient, and measures of teamwork.[12] Evaluation of integrated higher order performance, such as sequential hierchical decision making or psychomotor performance, is even more complex and difficult to standardize. Evaluation methods may be inherently flawed, particularly when addressing a group of novices, who have yet to achieve the automaticity characteristic of conscious competence which may allow relaxed, rapid, simultaneous performance of cognitive and psychomotor tasks. Utilizing simulator based examination techniques may significantly disadvantage students whose self-confidence and psychomotor talents lag behind their cognitive achievements. Furthermore, such methods of evaluation require validation and reliability before being used for high stakes assessment. An examinee centered approach to establishing assessment standards in simulation based training has been recently validated and advocated for performance based assessment using simulation methodologies.[13]

JABSOM has been a pioneer in the use of problem-based learning (PBL) for medical education.[14] Other institutions have reported their use of student-written medical cases as a learning and assessment tool. At Indiana University School of Medicine, students participate in a senior elective in PBL case writing. PBL case writing is reported to be an effective method to teach and evaluate students' application of basic science knowledge, communication, and problem solving skills.[16,16] The concept of PBL case writing may be logically expanded to simulator scenario case writing, but to our knowledge no one has reported the use of simulation scenario writing in this fashion. We developed SWSS to better fulfill our ideal of the optimal instrument for cognitive summative assessment in a simulation based curriculum. We demonstrated the reliability of this instrument, as well as its validity relative to clinical performance evaluation. The successful use of the SWSS in our JABSOM students may be attributable in part to the extensive experience that our students have in the PBL method, which is the primary educational format for the first two years at our medical school. The clinical entity of trauma resuscitation, with its well-defined algorithmic approach and key clinical tasks, also lends itself easily to use of the SWSS. We found that grading of the SWSS was made more facile by requiring the students to construct a 15-point binary checklist of the key clinical tasks in their scenario.

We expect that the SWSS will be easily assimilated by students and faculty at other institutions who are familiar with interactive, case-based learning. We propose further investigation of this assessment tool in other simulation based curricula, particularly curricula for crisis management with defined clinical algorithms.

Disclosure Statement

The authors have no financial relationships with companies relevant to the content of this paper.

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References

1. American College of Surgeons, *Successfully Navigating the First Year of Surgical Residency: Essentials for Medical Students and PGY-1 Residents*. 2005, Chicago, IL: American College of Surgeons.
2. Murray, D., et al. An acute care skills evaluation for graduating medical students: a pilot study using clinical simulation. *Med Educ*. 2002. 36(9):833-841.
3. Holcomb, J.B., et al. Evaluation of trauma team performance using an advanced human patient simulator for resuscitation training. *J Trauma*. 2002, 52(6): 1078-1085; discussion 1085-1086.
4. Gilbart, M.K., et al. A computer-based trauma simulator for teaching trauma management skills. *Am J Surg*, 2000. 179(3): 223-228.
5. Marshall, R.L., et al. Use of a human patient simulator in the development of resident trauma management skills. *J Trauma*, 2001. 51(1):17-21.
6. Lee, S.K., et al. Trauma assessment training with a patient simulator: a prospective, randomized study. *J Trauma*, 2003. 55(4): 651-657.
7. Nackman, G.B., M. Bermann, and J. Hammond. Effective use of human simulators in surgical education. *J Surg Res*, 2003. 115(2): 214-218.
8. Kim, J., et al. A comparison of global rating scale and checklist scores in the validation of an evaluation tool to assess performance in the resuscitation of critically ill patients during simulated emergencies. *Sim Healthcare* 2009;4(1):6-16
9. Prince, MJ, Felder RM. Inductive teaching and learning methods: definitions, comparisons and research bases. *Journal of Engineering Education* 2006;95(2):123-138.
10. American College of Surgeons Committee on Trauma, *TEAM Trauma Evaluation and Management. Early care of the injured patient: A program for medical students and multidisciplinary team members*. 2nd Edition ed. 2005, Chicago, IL: American College of Surgeons.
11. Kneebone, R. Evaluating clinical simulations for learning procedural skills: a theory-based approach. *Acad Med*, 2005. 80(6): 549-553.
12. Rosen, M.A., et al. Measuring team performance in simulation based training: adopting best practices for healthcare. *Sim Healthcare* 2008.3(1);33-41
13. Boulet, J.R., et al. Setting performance standards for mannequin-based acute-care scenarios. *Sim Healthcare* 2008;3(2):72-81
14. Kramer KJ, et al. Hamilton to Honolulu: Problem based learning local style. *Hawaii Medical Journal*. August 2002;61:175-176.
15. Agbor-Baiyee, W. *Problem-based learning case writing in medical science*, O.o.E.R.a.I. U.S. Department of Education. 2002, Educational Resources Information Center (ERIC). 1-7.
16. Bankston, P.W. and G. Porter. A five step approach to clinical case writing in the structural sciences. *Pathology Education*, 2001. 25(2): 42-44.

First and Lasting Impressions of the John A. Burns School of Medicine

Darrell G. Kirch MD; President and CEO, Association of American Medical Colleges

On May 15th, I had the distinct honor of addressing the graduating class of 2011 as well as their family, friends, and loved ones. In my five years as president of the Association of American Medical Colleges (AAMC), I relish few invitations as much as those to speak at graduation ceremonies. And in my 13 years as a medical school dean, commencement always stood out for me as one of the most significant and important milestones in the life of a physician. Such wonderful feelings are bound up in commencement—pride in accomplishments, anticipation of what comes next, and a shared sense of joy and celebration. It is for these reasons that I felt so privileged to have shared in this special day at the John A. Burns School of Medicine.

Since returning from the beautiful JABSOM oceanfront campus, I have had time to reflect on my first visit to Hawai'i's only medical school, what makes it unique, and the hopes I have for the class of 2011 and all future physicians.

What Makes the John A. Burns School of Medicine Unique

For me, the most striking characteristic of JABSOM is its incredibly diverse student body. In fact, I learned that JABSOM is the most culturally and ethnically diverse medical school in the United States, if not the world! The student population truly reflects the composition of the people of Hawai'i, the Pacific region, and beyond—an admirable feat that medical schools around the nation are working hard to achieve, and one that the AAMC supports through efforts such as our holistic admissions initiative.

The primary mission of JABSOM is to train physicians for practice in Hawai'i and the Pacific, and the school is succeeding on this front. Ninety percent of JABSOM students are state residents, and approximately 50 percent of the practicing physicians in Hawai'i have graduated from JABSOM or the Hawai'i Residency Program. These facts demonstrate the school's commitment to the people of Hawai'i, a state with a higher than average prevalence of chronic diseases such as asthma and diabetes and a greater percentage of the population living in poverty than the United States average.[1]

JABSOM's commitment to the Hawaiian people is also reflected in the career choices of its students. Half of JABSOM graduates enter residencies in the primary care specialties of internal medicine, family medicine, and pediatrics, or related fields like obstetrics/gynecology.[2] These specialties are integral to the creation of medical homes—places where patients can receive comprehensive care coordinated by a physician with whom they have a long-standing relationship. True reform of the nation's fragmented health care system cannot occur until we have the right numbers of primary care physicians in place, and JABSOM graduates will be well positioned to lead the change our health care system requires.

Lasting Impressions of a Celebration of Culture

Even before I left Washington, D.C. I knew that this graduation exercise would be different. Imagine my surprise and delight when I was told not to pack traditional graduation regalia, but an aloha shirt! (I couldn't help but wonder whether the debate in Washington would be more civil if legislators took their sartorial cues from island culture.) As the ceremony got underway, I couldn't take my eyes off the incredible amount of local color, from the delicate haku leis to the homemade Kihei garments. But what the absence of stiff formal wear lacked in familiarity, it overwhelmed me with comfort and a sense of ease.

As I settled into my seat and waited for the ceremony to begin, the first notes of the opening Oli chant, performed in the native Hawaiian language, signaled to me another beautiful expression of culture. The chant was every bit as much a call to ceremony as the traditional Pomp and Circumstance, but conveyed a unique sense of place. This element of the ceremony made it obvious to me why JABSOM excels at training professionals to care for the people of the Pacific—it recognizes that context, culture, and community mean so much.

Finally, I was touched by the ceremony's Maile lei-draping ritual. When I learned that the graduates received their Maile lei from a special person in their lives, I could only smile as those special people—loving sisters and brothers, proud mentors, and ecstatic grandparents—honored the graduates in this uniquely Hawaiian manner. In fact, there were tears of joy visible in more than one pair of eyes, especially for those for whom these graduates represented the first family member to complete college, let alone medical school. For all of these reasons, the JABSOM graduation ceremony will stand out in my mind as unique and among the most culturally diverse medical school commencements in which I have taken part.

Remembering Our Ethical Foundation

As new physicians, it is my hope that the class of 2011 never forgets the ethical foundation upon which medicine is built. The four ethical principles of clinical medicine to which physicians commit are wonderfully simple. The first is beneficence, an obligation to always seek the good in caring for patients. The second is non-maleficence, the rule of "above all, do no harm." The third is autonomy, respect for patients as people, for their privacy, and for their decisions. The fourth principle of clinical ethics is justice, a physician's obligation to make certain that all patients are treated fairly and that resources are used wisely. Unfortunately, our nation has created a health care system that in too many cases is marked by injustice. There are patients receiving the best care, even receiving too much care, while other patients receive no care at all until they are so ill they are wheeled into the emergency room. When one examines the ethical principle of justice, it is evident that many aspects of the health system are falling short.

My Charge to the Class of 2011

I have great faith in the class of 2011 and all future physicians. These bright minds could not have taken on the challenge of medical school if they were not deeply committed to helping others and deeply motivated by core ideals and ethics. Whether volunteering at the Waimanalo Health Center or running free clinics for the homeless through the Hawai'i Homeless Outreach and Medical Education Project, the class of 2011 worked hard to support Hawai'i's most vulnerable populations. By reaching out beyond the campus to serve and educate others, each student learned that part of working in health care is a commitment to social justice.

I hope the JABSOM graduates will take time to remember the professional legacy they have inherited, and the ethical obligations that come with it. While these students are likely to forget that I addressed them on their commencement day, I hope they do three very important things:

1. Cherish the precious memories and enduring relationships formed in their years at JABSOM.

2. Adhere to the fundamental values of compassion, integrity, and service that lie at the heart of the Hippocratic tradition.

3. Find the courage to bring more justice to our health care system and make sure we never lose the sense of doing good and creating a better society. After all, that is what brought each of us to medicine in the first place.

I would like to thank Dean Hedges and the class of 2011 for allowing me to share this special day with JABSOM. I again extend my congratulations to our nation's newest physicians.

References

1. statehealthfacts.org
2. Association of American Medical Colleges (AAMC) Data Warehouse, GME section. {30 May 2011}.

Ola i ke ahe lau makani (2483) "Life is in a gentle breath of wind."
Said of a breeze on a hot day.

Mary Kawena Pukui's 'Olelo No'eau: Hawaiian Proverbs & Poetical Sayings (Bishop Museum Press 1983)

Letter to the Editor — An Open Letter to My Son: Five Virtues

Jinichi Tokeshi MD
Department of Family Medicine, John A. Burns School of Medicine, University of Hawai'i

May 2011
Dear Brad:

I have taught generations of medical students, sons and daughters of other fathers, for over three decades. For some reason I failed to talk to you about what I thought was very important as a physician and a person. As you are launching a new life as a physician I would like to share my inner thoughts and principles that I have lived by in a form of an open letter. It is called five virtues. There are many variations of five virtues quoted in the literature and the concept is nothing new. It goes back to an ancient Chinese philosopher.[1] The idea was also used as an instrument to educate the children of samurai the bushido,[2] the way of warrior, in Japan prior to Meiji Restoration. Here, I include Jin, Gi, Rei, Chi, and Shin with my personal interpretations that guided me in the way of medicine.

Jin is the first virtue. Jin[3] is compassion or empathy to fellow human beings as its kanji character suggests. Incidentally, my first name, Jinichi[4] means Jin comes first. It embodies your grandfather's prayer and wish for me to become a person of Jin from birth. I can tell you what Jin is but it is not something I can teach anyone. You either have it or don't have it. Consequently, if you have it I do not need to tell you about it and if you don't it is futile to talk about it. However, for the sake of discussion let me pursue this subject. Your ability to sense and share your patient's pain, loneliness, sadness, fear, anger, and desperation is probably the most important quality of you as a physician. In your training you will see patients with those feelings one at a time or all at once. I know you have Jin in you as I have watched you growing up. If you did not you would not have chosen medicine as your career. It has been said, "The way of medicine is through the art of Jin."[5] Indeed, medicine is half science and half art. Based on a concept of Ichigo Ichie[6] examine your patient with your heart and soul as if this is the last time. Please greet your patients with a smile. Touch your patients in ICU with your warm hand even if they appear unresponsive. They may be aware of what is happening. Sit at the bedside and talk to your elderly patients in the nursing homes. They are lonely. Gently hold the hands of your patient whose death is approaching. They are frightened. I trust you do not become accustomed to the pain of your patients and get desensitized along the way of long training. If we misplace our Jin we should relinquish being a physician immediately.

Gi, I take it to mean the duty. The duty of a physician is nothing like any other profession. Once you have chosen to become a physician you have forfeited many routines in your life that other people would take for granted. When your patients need your assistance you will drop all your activities and run for the aide. Yes, it means even if you are sleeping or eating. Here lies the origin of the precept for my students, "eating and sleeping is optional." You are charged with awesome responsibility of saving lives and alleviating the pain and suffering of your patients. Please don't forget your duty as a physician even when you are sleeping, eating or spending time with your loved ones. Even if the disease is incurable do not abandon your patient. Support your patient at times as a cheerleader or a coach. At the end of the day your presence at the bedside could be more comforting than any medicine that you can prescribe. Let us not forget our duty extends to comforting the family left behind. There is no word to ease the pain of losing a loved one; however, your presence will let the family know that you understand their grief. This is the reason why I come to pronounce my patients no matter what time it is. It is the last service a physician performs for the patient.

Rei means to respect and be humble. First, respect your patients. Your patient is the sole reason why you decided to undergo the vigorous training to become a physician. In a word, you are a servant to your patients. Talk and act like a servant. Never give an order or talk condescendingly to your patients regardless of their illness, age, gender, ethnic, educational, socioeconomic, and cultural background. Even if the patient is intellectually challenged he can sense if you are talking down to him. You are never superior to any of your patients even if you have reached the highest peak as a physician. Let it be known to all that you are simply the best educated and the best trained noble "servant" to your patients. Thank the patients who seek out to see you. Say, "thank you" for being patient and apologize for making them wait.

Respect and thank your parents who taught you how to say, "thank you," "please," and "excuses me." Treasure and honor your parents who gave you unconditional love and unending support even after they can no longer hear, see or remember. Thank your long line of ancestors who gave you the traits to excel. Thank your spouse who supports your work and not complain about your hours of work. I deeply appreciate your mother for supporting me all these years. Without her understanding I could not have done what I did. Thank your future children who understand your commitment to your patients. Please spend not large quantity but quality time with your children. I thank you for sharing quality time with me and growing up to be a responsible adult. Respect all your past teachers from kindergarten on who taught you how to read and how to count. Respect all your future teachers who will give you the knowledge and teach the skills in the way of medicine. Respect and thank everyone who made you who you are today. Thank your coworkers, nurses, aides, ward clerks, housekeepers, and cafeteria/dietary workers. Greet them with a smile for they will help you become the best servant that you can be to your patient. You did not become who you are by yourself and you cannot do what you set out to do alone. Respect your instruments to do the job of the way of medicine. Your stethoscope invented by Laennec[7] almost 200 years ago is your soul as the sword was the soul of a samurai. Train to use it well and keep it warm with your body at all times. Never let it leave your possession while you are on duty. Respect the places of healing as a physician as the dojo[8] was the place of training and enlightenment for a samurai.

In martial art we bow countless times in the process of training. Bowing is the outer expression of the inner humility; however, you do not necessarily have to bow if you have the inner humility. Likewise, a bow without inner humility is just an empty act. Your inner humility will manifest itself by your eyes, facial expressions, body languages, choice of words, and in a manner the words come

out of your mouth or sometimes just being silent. Silence is akin to an empty space in a Japanese brush painting that has a very powerful statement and accentuates your message. Remember your eyes and silence can speak louder than your words at times or to put it another way, you do not have to speak loud or spend many words to be heard by your patients. For an example, keep your eye level slightly lower than that of your patient to let them know they are superior than you are.

Don't ever get angry or show your anger to anyone. It is a sign of immaturity, insecurity and lack of training. If a samurai gets angry he reveals suki[9] in him and gets struck by his calm opponent. That is acceptable. However, if you, as a physician, get angry you become irrational and might harm your patient. This is absolutely not acceptable. Thank the person who tries to anger you for he is giving you the chance to discipline yourself. Lastly, train yourself to eliminate surprise, fear, doubt and indecision[10] from your mind as a physician.

Chi is the fourth virtue. It is the knowledge in medicine; an important weapon to fight the illness. You may be filled with compassion, have a sense of duty and know how to respect but if you don't have the knowledge you are doomed as a physician. Study, study, and study more. You study everyday so you are better equipped today than yesterday and tomorrow you will be wiser than today. Your life as a physician means you commit yourself to learning constantly in a rapidly changing environment and advances in medical science. You know medical information will turn over much more rapidly in the 21st century than the previous one. In addition, study history and other general topics to be well-rounded person. At the same time, don't be afraid to say, "I don't know." There is always something we don't know. You just need to study to find the answer or consult the expert. Do I study, you ask? You bet. I study everyday. You will be in the position to teach soon. Consider whatever knowledge and skill you have is a common property and share it freely without compensation. Teaching means learning twice. Sharing your knowledge will not diminish your own; instead it will enrich you. The ultimate beneficiary of your teaching is not your students you teach but their future patients. Regardless of the boundary of geography or time the patients are all the same.

Shin is a belief and conviction. Believe in your patients and yourself. Believe in something superior than anyone of us. Have a firm conviction in your principle and goal that you can pursue rest of your life. Believe that you can improve the lives of your patients and condition of the society. Maintain a perpetually burning flame of passion in your heart as the first day you decided to become a physician.

Five virtues, this, I firmly believe.

Sincerely,
Dad

Footnotes

1. Confucius (551-478 BC). His quasi-religious philosophy dominated much of Japanese education of children and studying his books was a sign of educated person until the Meiji Restoration in 1868.
2. The term Bushido was introduced to the West by Nitobe Inazô (1862-1933) in his book written in English with the same title, Bushido. He was a western educated Japanese scholar (5 PhDs), Christian, philosopher, educator, author and politician.
3. 仁: Consist of symbol イ=人 that represents person and 二 that represents numeral two.
4. Jinichi: 仁一 Jin followed by numeral one.
5. 医者仁術也: Aphorism from ancient Japan.
6. The word originates in Zen and tea ceremony. It literally means one time one meeting. It is usually translated as "for this time only" or "one chance in a lifetime." Even if you meet again the person and you may have changed. Further, venue may have changed and the time has definitely changed. It emphasizes the importance of present and transience in the universe.
7. Rene Theophile Hyacinthe Laennec (February 17, 1781-August 13, 1826); a French physician Born in Brittany, France, invented the stethoscope in 1815 but he did not obtain patent so it would benefit all the physicians and their patients in the future.
8. Dojo literally means "place of the way". It usually refers to the place of training of the way of martial arts (i.e. kendo, judo, kyudo, laido) but also refers to a training place of any other art (dance) and religion (Zen). It is mentioned in the earliest Buddhist sutra as a place of enlightenment.
9. Suki is an opening or break in concentration or readiness; a moment of vulnerability. Famed swordsman and an author of Gorin no Sho/Book of Five Rings, Miyamoto Musashi, was a master of psychological tactics and made his opponent angry to create suki. He won 68 consecutive duels.
10. Kyo, ku, gi, and waku are considered four forbidden state of mind in martial art.

Ha'alele koa wa'a i koa kanaka (398). "The koa canoe has departed, leaving the warriors behind." Said when a canoe goes off and leaves the people behind.

Mary Kawena Pukui's 'Olelo No'eau: Hawaiian Proverbs & Poetical Sayings (Bishop Museum Press 1983)

HMJ Instructions to Authors
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REFERENCES
1. Ball MJ. The library of the future: An informatics institution. *Br J Lib Sci*. 1995;40:85-88.
2. Freeman GT. Trends and recent experiments in library design. *Comp Methods Prog Biomed*. 1994;44:161-166.

- **Statistical Probability** ***P***
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We recommend that articles be divided into sections with headings:

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THE WEATHERVANE

RUSSELL T. STODD MD, CONTRIBUTING EDITOR

❖ THUMBS DOWN, LADY! YOU ARE PUMPING IRONY.

A 64-year-old woman has suffered for 20 years with biliary cirrhosis, and now her liver is failing. Her doctor wanted to place her name on the transplant list in her home state of Kansas. She is a Jehovah's Witness and wants bloodless surgery which would have to be done in Omaha, Nebraska. She is a Medicaid patient and Kansas health officials refused to pay for the out-of-state surgery. A three-judge appeals court overturned that ruling, citing a constitutional right to religious freedom. If all goes according to her plan, she will be examined at the Nebraska medical center and placed on the liver transplant waiting list. Jehovah's Witnesses grew up as an aggressive evangelical sect in the 1930s and now number about one million in America. They will not don a uniform, serve in the armed forces, and will not salute the American flag nor pledge allegiance to our democracy. This absurd case represents a double-barreled demonstration of religious hypocrisy: (1) the patient will accept another person's organ but not a drop of his blood, and (2) the patient exercises the power of the constitution of a republic she does not respect.

❖ RED FLAG COULD MEAN SUNSET FOR THE PATIENT.

A 60-year-old man chose not to see his family doctor, but went directly to an orthopedic surgeon to evaluate his intermittent back and hip pain. The orthopedist ordered an MRI which was interpreted as spinal stenosis, and the radiologist further reported a cystic mass at the inferior pole of the left kidney, approximately 3.5 cm. in diameter. He recommended further evaluation with computed tomography (CT) both with and without contrast. The report indicated that a "copy" was sent to the surgeon and the "PCP." Neither the family doctor nor the surgeon recall being made aware of the renal mass at that time, and the PCP found no record of ever receiving a copy of the MRI report. The patient became vividly aware of the renal tumor 4 months later when he saw another doctor for follow-up visit. Fortunately for the physicians involved and especially the patient, subsequent surgical removal of the mass established a diagnosis of a benign oncocytoma. The case is much more than interesting, because it represents a serious defect in communication. All doctors and facilities need mechanisms for reporting findings and obtaining receipt, both for the patient's care and medical liability. This case is a red flag that trial attorneys love.

❖ HAS ANYONE SEEN MY GLASSES?

The American Hospital Association records 30 million surgeries and 4 million baby deliveries each year. Along with these data is a very alarming statistic of 1,500 to 2,000 retained surgical items (RSI) after wound closure. Despite strict counting protocols, surgical sponges, towels, gauze and even instruments are unintentionally left inside patients. Such preventable events are a potential source of morbidity – post-procedure infection, pain, bowel perforation, abscess, additional surgery or even death. A study published in 2008 by the Journal of the American College of Surgeons noted that 62% of RSIs were detected after the surgical count was reported as correct. A subsequent report from the Association of periOperative Registered Nurses (AORN) found that the top five causes of RSIs were distraction, multitasking, time pressure, emergency cases, and not following procedures. State-of-the-art radio-frequency (RF) devices may eradicate the problem with a detection system designed to alert the operating room staff with a complete scan in 15 seconds. These devices are expensive, but what about the cost of a malpractice suit?

❖ IS THERE A GREATER SIN THAN NEGLECTING YOUR CHILD?

In Massachusetts a woman was convicted of attempted murder and found guilty of child endangerment and assault and battery for failing to give her son his cancer medication. For five months she withheld at-home chemotherapy medication. The child's oncologist testified that she told the mother that her autistic son had non-Hodgkins lymphoma, but the cure rate was 85 % to 90% under treatment. He died at age nine. The mother's attorney told the jury that she was depressed and overwhelmed, and made a tragic mistake.

❖ PUT YOUR MONEY WHERE YOUR MOUTH IS.

At last we have a politician who is willing to attack the problem of fat America. Governor Jan Brewer in Arizona wants to levy a $50 fee on Medicaid smokers who refuse to quit, and obese patients who do not follow a physicians weight loss plan. According to the Centers for Disease Control and Prevention (CDC) 25.5% of Arizona citizens were obese as of 2009, and 46% of Medicaid recipients are regular smokers. The fee would apply only to certain people without dependent children. No politician has previously displayed the fortitude to financially address the problem of health care and individual responsibility.

❖ COLLECT ALL THE PICTURES AND WIN LUNG CANCER.

A 2009 law gave the Food and Drug Administration (FDA) the power to demand that tobacco companies add large, graphic warning labels of a ghoulish description to the top half of the front and back of cigarette packs. One image is a baby near a cloud of smoke and a dead body. Another depicts a man exhaling smoke through a hole in his neck. There are nine images accompanying the message "Smoking Can Kill You." Reynolds American Inc., Lorillard Inc., and other tobacco companies sued the FDA, arguing that the graphic labeling violates their constitutional rights to free speech. Twenty percent of Americans continue to puff, so the printed warning has not been successful. Hopefully an ugly picture will influence the illiterates.

❖ HEY! NOBODY ASKED ME! WHAT ABOUT INFORMED CONSENT?

Come November, the voters of San Francisco will be asked to weigh in on a matter that should be considered a private family concern, male circumcision. Election officials confirmed that an initiative received enough signatures to place a ban on male circumcision on the ballot. Violation would become a misdemeanor. Supporters of the ban claim male circumcision is a form of genital mutilation that shouldn't be forced on a young child. If this passes will it provide grounds for a legal complaint against one's parents?

❖ THE FINEST MEDICAL CARE CAN BE DANGEROUS.

A Caucasian woman age 61 with hypertension, colon cancer, and osteoporosis was being followed by a neuro-surgeon. She had undergone clipping of an aneurysm of the anterior communicating artery two years previously. Her vision was decreasing in the left eye, first with loss of a quadrant, eventually near total blindness. Over a year's time, she was seen by various ophthalmologists, but none could determine the cause. To her horror, she noticed vision was decreasing in her right eye. Lumbar puncture was normal and an MRI showed generalized optic nerve atrophy. Careful reading of the operative report for her aneurysm surgery read, "We then placed muslin over the region of the sessile aneurysm…and then placed a small piece of Gelfoam powder to secure it." Muslin-generated optic neuropathy is a known, but rare disorder. Muslin causes inflammation, fibrosis and thickening of the aneurysm wall. Well and good to secure the vessel defect, but the inflammation can involve nearby tissues leading to various complications including visual defects. There is no accepted effective treatment although multiple therapies have been tried.

❖ WAS THIS A CRIME OR A SCAVENGER HUNT?

In Sonoma, California, a 53-year-old man with failing eyesight had previously undergone intestinal surgery. On May 1st a woman arrived at his apartment, uninvited and unexpected. She said she was there to administer his enema. She led him to the bedroom, instructed him to remove his clothes and lie face down on his bed. He did so and she administered an enema in a just a few minutes and then departed. She left no card and did not identify herself. The doctor said he did not order an enema and had no idea who the woman was. The police are mystified, but suspect bowel play.

❖ CARRYING ACADEMIC FREEDOM A BIT TOO FAR.

At California State University Northridge, Professor of Mathematics Tihomir Petrov, was charged with misdemeanors for allegedly urinating twice on the door of a colleague with whom he had been feuding. He was identified by a hidden camera installed after previous puddles had appeared.

ADDENDA

❖ The Parents Television Council has found that use of foul language in prime-time broadcast TV has increased 70% since 2005.

❖ Consumer Reports stated that 71% of survey respondents were "tremendously annoyed" when they couldn't reach a human voice on the phone.

❖ Robert De Niro has died in 15 films, more than any other living lead actor.

❖ The world's earliest known winery, dating back to about 4000 B.C. was unearthed in Armenia.

❖ Deja moo: the feeling that you have heard this bull before.

ALOHA AND KEEP THE FAITH **rts**■ *(Editorial comment is strictly that of the writer.)*