Center for Health Systems Innovation

Transforming Rural and Native American Health

Differential Effects of Digoxin Use on Atrial Fibrillation Patients by Race and Gender

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ABSTRACT

OBJECTIVE:

Verapamil and Digoxin are commonly prescribed medications in patients diagnosed with atrial fibrillation to assist with control of the patient's heart rate. Verapamil is a calcium-channel blocker and Digoxin is a cardiac glycoside. Of the two medications, Verapamil is the only one that is FDA-approved for use in atrial fibrillation, but many cardiologists still prescribe Digoxin in this patient population.

The focus of this study is to compare mortality across gender and ethnic groups in patients taking Verapamil, Digoxin, and Verapamil + Digoxin. Previous studies using similar methods have shown that there is not a significant difference in mortality rates when the data is analyzed on drug usage alone. Full population results showed that the mortality rate with Digoxin + Verapamil use is higher than monotherapy.

METHODS:

Patient data was extracted from the Cerner HealthFacts Data Warehouse. Patients were extracted based on a diagnosis code of Atrial Fibrillation using the ICD-9 code 427.31.

RESULTS AND CONCLUSIONS:

A differential effect is seen when the data is analyzed by race and gender. The data showed that African American women have the highest mortality rate overall, but the mortality rate for this group is lowest when Digoxin is used alone. It also showed that Caucasian men have the lowest mortality rate when Verapamil is used alone, when compared with the mortality rates when Digoxin or Digoxin + Verapamil are used.

REFERENCES:

- Seshadri Sundararajan, Adithya & Ganesan, Ajay "Analyzing the Risks associated with Digoxin and Verapamil Using SAS Enterprise Guide™ and SAS Enterprise Miner™"
- Tze-Fan, C., Chia-Jen, L., Ta-Chuan, T., Su-Jung, C., Kang-Ling, W., Yenn-Jiang, L., Shih-Lin, C., Li-Wei, L., Yu-Feng, Hu., Tzeng-Ji, C., Chern-En C., & Shih-Ann, C. (2015). Rate-Control Treatment and Mortality in Atrial Fibrillation. *Circulation*, 132(17), 1604-1612. 10.1161/CIRCULATIONAHA.114.013709

METHODS

Patient data was extracted from the Cerner HealthFacts Data Warehouse. The data is stored in a SQL database at Oklahoma State University. A SQL query was written to extract patients who had a diagnosis code of Atrial Fibrillation using the ICD-9 code 427.31. Datasets were extracted as a Tab Delimited File. This file was uploaded into Microsoft Excel.

The patient records were cleaned and prepared for analytics to account for missing data, duplicate data, and null values. Specifically, the unwanted variables were removed and the records with these null values were either ignored, imputed or reclassified based on the variables to which these instances are associated. In order to evaluate the effectiveness of Verapamil and Digoxin the patient records were separated into those patients who received only Verapamil or only Digoxin. This patient dataset for both drugs (Digoxin and Verapamil) had 14 variables.

Also, new variables (Length of stay, Survival rate and Charge Category) were created to help with descriptive statistics and survival analysis. Length of stay is calculated by calculating the difference between the admitted date & time of a patient and the discharge date & time of that patient. Survival rate variable is used to indicate the current state of the patient (expired or alive). Charge category classifies patients into different categories based on the charges incurred. These changes were implemented for the datasets for both Verapamil and Digoxin.

A comparative analysis on the patient data was performed for patients who were given either Verapamil or Digoxin. This study uses a part of the CRISP-DM methodology.

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RESULTS BASED ON GENDER

Following are the results of the descriptive analysis on the data for females:
- Verapamil: 2.0626% mortality rate
- Digoxin: 1.8921% mortality rate
- Verapamil + Digoxin: 2.0528% mortality rate

Following are the results of the analysis on the data for males:
- Verapamil: 1.3084% mortality rate
- Digoxin: 1.7169% mortality rate
- Verapamil + Digoxin: 2.2989% mortality rate

RESULTS BASED ON RACE

Following are the results of the descriptive analysis on the data for African Americans:
- Verapamil: 4.3478% mortality rate
- Digoxin: 3.1004% mortality rate
- Verapamil + Digoxin: 5.1282% mortality rate

Following are the results of the analysis on the data for Caucasians:
- Verapamil: 1.5172%% mortality rate
- Digoxin: 1.7268%% mortality rate
- Verapamil + Digoxin: 5.1282% mortality rate

RESULTS BASED ON GENDER & RACE

Following are the results of the descriptive analysis on the data for African American females:
- Verapamil: 5.6075% mortality rate
- Digoxin: 3.3849% mortality rate
- Verapamil + Digoxin: 6.0000% mortality rate

Following are the results of the analysis on the data for African American males:
- Verapamil: 2.5974% mortality rate
- Digoxin: 2.7618% mortality rate
- Verapamil + Digoxin: 3.5714% mortality rate

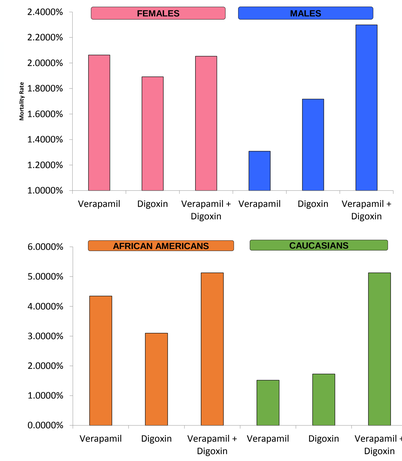
Following are the results of the descriptive analysis on the data for Caucasian females:
- Verapamil: 1.7814% mortality rate
- Digoxin: 1.80341% mortality rate
- Verapamil + Digoxin: 1.6779% mortality rate

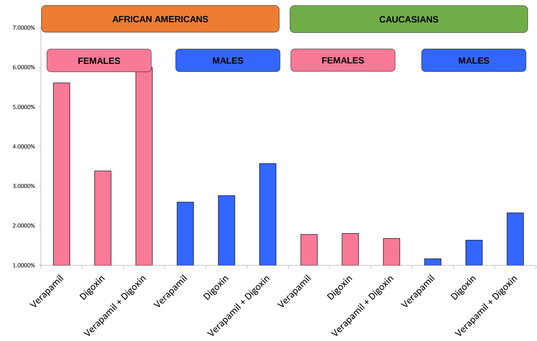
Following are the results of the analysis on the data for Caucasian males:
- Verapamil: 1.1653% mortality rate
- Digoxin: 1.6365% mortality rate
- Verapamil + Digoxin: 2.3256% mortality rate

POPULATION DISTRIBUTION

	Total	Females	Males	African Americans	Caucasians	African American Females	African American Males	Caucasian Females	Caucasian Males
Verapamil	2,476	1,406	1,070	184	2,179	107	77	1,235	944
Digoxin	3,491	1,215	2,276	1,153	2,166	185	223	968	1,943
Verapamil + Digoxin	1,117	682	435	78	983	50	28	596	387
Total	7,084	3,303	3,781	1,415	5,328	342	328	2,799	3,274

GRAPHIC RESULTS





CONCLUSION

This study shows that in women Digoxin is associated with a lower mortality rate when compared to Verapamil and Verapamil + Digoxin. Conversely, it shows that Verapamil is associated with a lower mortality rate in men when it is compared to Verapamil and Verapamil + Digoxin. It is important to note that Verapamil is the only medication in this study that is approved by the FDA for use in atrial fibrillation patients. Some cardiologists do use Digoxin or Verapamil + Digoxin for this purpose.

The study also shows that in African Americans Digoxin is associated with a lower mortality rate when compared to Verapamil and Verapamil + Digoxin. In Caucasians, Verapamil is associated with a slightly lower mortality rate when compared to Digoxin. Both Verapamil and Digoxin use in Caucasians are associated with a moderately lower mortality rate than Verapamil + Digoxin use. The mortality rate in Caucasians is lower with Digoxin use when compared with African Americans. The same can be said for Verapamil use.

When the mortality rates are calculated for gender and ethnicity, there are a couple of interesting points. In African American women, Digoxin is associated with a moderately lower mortality rate than Verapamil and Verapamil + Digoxin. In Caucasian men, Verapamil is associated with a slightly lower mortality rate than Digoxin and Verapamil + Digoxin.

These findings may become important considerations for physicians when choosing which medication to prescribe for atrial fibrillation rate control.

FUTURE RESEARCH OPPORTUNITY:

This research can be extended to include other outcome measures such as readmissions and complications. There is also potential for further studies including common comorbidities associated with atrial fibrillation, such as congestive heart failure, diabetes mellitus, and hypertension. The research can also be extended to include the use of beta-blockers.

Scoping gastroenterology journals: 100% of meta-analyses tested positive for publication bias

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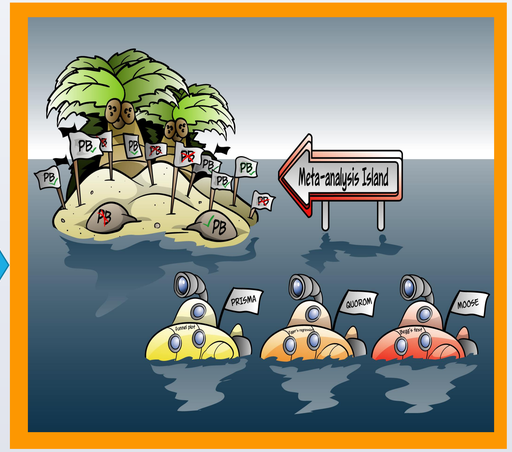
Background

As this cartoon shows, inherent to systematic reviews and meta-analyses is a methodological problem that only published clinical trials yielding statistically significant outcomes are included in estimating the overall summary effect.

This issue is known as publication bias.

Publication bias has been described as "the tendency on the parts of investigators, reviewers and editors to submit or accept manuscripts for publication based on the direction or strength of the study findings".

Dickersin, K. The existence of publication bias and risk factors for its occurrence. JAMA 1990;263:1385-9.

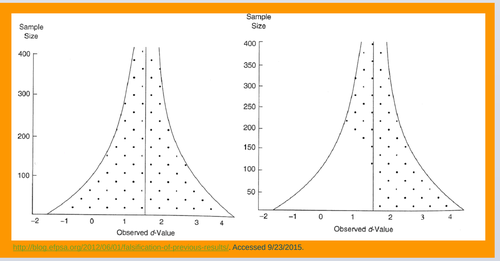


No studies, to date, have looked at the practices of publication bias assessment among systematic reviews and meta-analyses from the gastroenterology literature, so the extent which these assessments are routinely conducted as well as **the degree of publication bias presence is largely unknown**.

Publication bias is particularly problematic, given that combining only statistically significant outcomes is likely to overestimate the true effect of an intervention since marginal or non-significant findings have been omitted

The funnel plot on the left shows a adequately distributed number of studies.

The funnel plot on the right indicates publication bias by the missing studies.



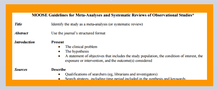
http://blog.ehpa.org/2012/06/01/falsification-of-previous-results/. Accessed 9/23/2015.

Assessing PB is an integral part of the data synthesis process and a requirement of prominent reporting guidelines – Quality of Reporting of Meta-analyses (QUOROM) Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) and Meta-analysis Of Observational Studies in Epidemiology (MOOSE).


THE LANCET

Improving the quality of reports of meta-analyses of randomised controlled trials: the QUOROM statement


PRISMA 2009 Checklist


MOOSE Guidelines for Meta-Analyses and Systematic Reviews of Observational Studies

Methods

We examined 215 systematic reviews and meta-analyses from 3 gastroenterology journals to answer our research questions:
What are the prevalence, methods and guidelines used to report publication bias in these articles?
In those studies not reporting publication bias, to what extent is publication bias present?

First, meta-analyses and systematic review abstracts were identified using a PubMed search of the top three gastroenterology (excluding hepatology) journals according to Google Metric h-5 index as of Jan 30, 2015. The journals included in our search were:


The American Journal of Gastroenterology


Gastroenterology


Gut

The PubMed search resulted in 304 articles from three journals. After removing one duplicate, all articles were subjected to full-text review. After this process, 88 articles were excluded for not meeting criteria as a systematic review or meta-analysis. A total of 215 articles were included in this study

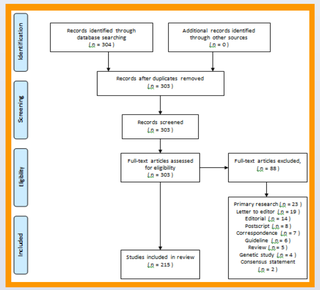
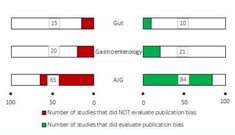


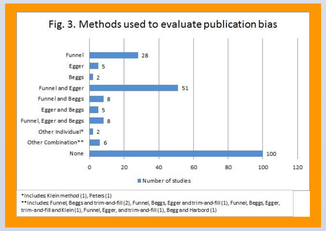
Figure 2. Frequency of evaluating publication bias in selected journals.



In our sample, 53.49% (115/215) of reviews reported assessing publication bias and 46.51% (100/215) did not. From the 115 studies that evaluated for publication bias, only a minority (20.87%; 24/115) reached the conclusion that publication bias was present in their work.

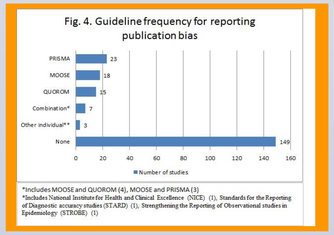
The funnel plot was the most common method reported for publication bias assessment. Across systematic reviews that evaluated for publication bias, it is notable that 67.83% (78/115) used a combination of methods.

Fig. 3. Methods used to evaluate publication bias



*Includes Klein method (1), Peters (1)
**Includes Funnel, Begg and trim-and-fill (2), Funnel, Begg, Egger and trim-and-fill (1), Funnel, Begg, Egger, trim-and-fill and Ken (1), Funnel, Egger, and trim-and-fill (1), Begg and Harbord (1)

Fig. 4. Guideline frequency for reporting publication bias

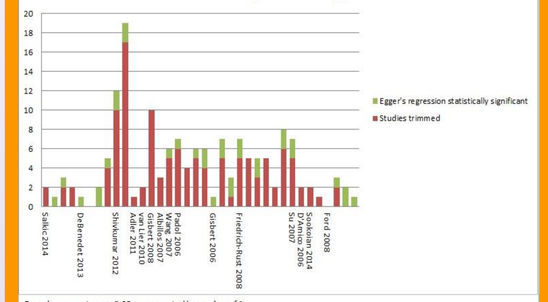


*Includes MOOSE and QUOROM (4), MOOSE and PRISMA (3)
*Includes National Institute for Health and Clinical Excellence (NICE) (1), Standards for the Reporting of Diagnostic accuracy studies (STARD) (1), Strengthening the Reporting of Observational studies in Epidemiology (STROBE) (1)

The majority of systematic reviews did not use reporting guidelines. Of systematic reviews using a reporting guideline (66/215), only 63.64%, (42/66) evaluated publication bias.

Results

Fig. 5. Comparison of Egger's regression and trim-and-fill method for meta-analyses omitting publication bias



Egger's regression $p < 0.05$ represented by a value of 1.
Egger's regression $p < 0.01$ represented by a value of 2.
Note: Many systematic reviews contained multiple meta-analyses. Author's names are presented below the first meta-analysis of a systematic review. Blank spaces following authors' names represent additional meta-analyses within that same review.

Our final sample consisted of 15 articles and 36 meta-analyses. Figure 5 graphically represents our re-analysis of publication bias, in those articles not reporting an analysis, using Egger's regression and trim-and-fill method.

We found evidence for publication bias in at least one meta-analysis for all (15/15) studies.
All systematic reviews contained at least one meta-analysis which required trimming.
Using Egger's regression, 10 meta-analyses were statistically significant for publication bias at $p < 0.05$, and 11 meta-analyses were statistically significant for publication bias at $p < 0.01$.
The remaining 15 meta-analyses did not show evidence of publication bias using Egger's regression.

Table 1. Re-analysis of publication bias among non-reporting meta-analyses

Article	Figure/ Table	Studies Trimmed	STROBE Model Used	Observed Point Estimate (CI)	Adjusted Point Estimate (CI)	Egger's Intercept	t-value
Salkic [17]	A	2	random	0.71 (0.64, 0.78)	0.68 (0.61, 0.74)	2.27	1.26
	B	0	random	0.82 (0.76, 0.88)	0.82 (0.76, 0.88)	3.55	2.40*
	C	2	random	0.72 (0.63, 0.80)	0.69 (0.59, 0.78)	3.47	1.82*
	D	2	random	0.86 (0.83, 0.89)	0.85 (0.81, 0.88)	1.52	1.37
DeBenedet [18]	A	0	random	0.91 (0.89, 0.93)	0.91 (0.89, 0.93)	4.19	1.87*
	B	0	random	0.10 (0.08, 0.12)	0.10 (0.08, 0.12)	-0.06	0.02
	C	0	random	0.91 (0.86, 0.94)	0.91 (0.86, 0.94)	4.15	3.33**
	D	4	random	0.96 (0.97, 0.99)	0.97 (0.95, 0.98)	0.77	1.89*
Shivkumar [19]	A	10	random	0.95 (0.93, 0.96)	0.92 (0.90, 0.94)	4.56	3.52**
	B	17	random	0.99 (0.98, 0.99)	0.97 (0.95, 0.98)	2.52	4.32**
Adler [20]	A	1	random	1.17 (1.10, 1.25)	1.18 (1.10, 1.26)	0.08	0.12
van Lier [21]	A	2	random	0.23 (0.19, 0.28)	0.24 (0.20, 0.29)	0.28	0.39
Gisbert [22]	B	10	random	0.05 (0.03, 0.07)	0.07 (0.05, 0.09)	-0.67	0.78
Albillos [23]	A	3	random	0.30 (0.17, 0.53)	0.39 (0.23, 0.63)	-3.16	1.74
Wang [24]	A	5	random	3.38 (2.15, 5.32)	4.72 (3.07, 7.25)	-1.56	1.86*
Padol [25]	A	6	random	2.64 (1.42, 4.91)	1.49 (0.75, 2.93)	2.76	3.99**
	B	4	random	1.90 (1.38, 2.60)	1.44 (1.00, 2.07)	2.38	1.8
	C	5	random	1.34 (0.90, 2.01)	1.06 (0.68, 1.71)	1.46	2.60*
	D	4	random	4.04 (1.97, 8.31)	2.71 (1.33, 5.53)	2.08	3.49**
Gisbert [26]	A	0	random	0.89 (0.80, 0.77)	0.89 (0.80, 0.77)	6.93	7.12*
	B	5	random	0.96 (0.92, 0.98)	0.92 (0.85, 0.96)	3.05	6.59**
	C	1	random	0.78 (0.64, 0.88)	0.75 (0.31, 0.85)	6.37	2.92**
Friedrich-Rust [27]	A	5	random	0.82 (0.76, 0.86)	0.77 (0.71, 0.82)	4.14	5.65**
	B	5	random	0.80 (0.71, 0.86)	0.74 (0.62, 0.82)	-0.74	0.3
	C	3	random	0.81 (0.75, 0.86)	0.77 (0.70, 0.82)	3.9	3.05**
	D	5	random	0.91 (0.88, 0.93)	0.88 (0.85, 0.91)	1.56	1.38
	E	2	random	0.89 (0.86, 0.92)	0.88 (0.85, 0.91)	1.79	1.63
	F	6	random	0.91 (0.88, 0.93)	0.86 (0.81, 0.89)	3.07	3.95**
Su [28]	A	5	random	0.14 (0.09, 0.22)	0.21 (0.13, 0.32)	-2.62	3.84**
D'Amico [29]	D	2	both	0.16 (0.09, 0.31)	0.20 (0.11, 0.37)	-2.47	0.23
Sookoian [30]	A	2	both	0.69 (0.58, 0.81)	0.73 (0.62, 0.87)	-0.18	0.09
	B	1	both	0.66 (0.56, 0.81)	0.71 (0.60, 0.83)	0.06	0.04
Ford [31]	A	0	random	0.66 (0.56, 0.78)	0.66 (0.55, 0.79)	-2.48	0.43
	B	2	random	0.53 (0.43, 0.63)	0.57 (0.46, 0.68)	9.19	1.79*
	C	0	random	0.38 (0.24, 0.54)	0.38 (0.24, 0.54)	-19.39	3.05**
	D	0	random	0.72 (0.63, 0.80)	0.72 (0.63, 0.80)	9.43	1.93*

*P-value (1-tailed) <0.05
**P-value (1-tailed) <0.01
CI = Confidence Interval

Discussion

- Systematic reviews and meta-analyses are convenient ways for physicians to stay up-to-date on a topic.
- Publication bias is often overlooked by systematic reviewers and calls attention to the need for greater awareness of systematic review practices when conducting such an investigation.
- Most meta-analyses which analyzed publication bias used a combination of methods. A combination approach may provide more information, while at the same time, leading to confusion if two methods contradict one another.
- Publication bias evaluations were not commonly performed, contrary to reporting guidelines calling for such evaluations.
- Re-analysis of the studies in our sample found all systematic reviews contained at least one meta-analysis that showed some degree of publication bias.

Hypertension prevalence and perceptions among the Hmong in Oklahoma

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Faculty Advisors: Amanda Gorden-Green, D.O. and Sarah Hall, D.O.

Abstract

Uncontrolled hypertension is one of the major risk factors that can lead to cerebrovascular accidents, which can have detrimental consequences. Majority of patients with hypertension do not have symptoms until their blood pressure is extremely elevated. Due to the growing Hmong population within Oklahoma, and the high rates of hypertension overall, the aim of this study was to uncover the prevalence and perceptions about hypertension with the intent guide culturally specific preventative care education within the Hmong population. In turn, this information would improve patient care and reduce the long term consequences of uncontrolled blood pressure.

Since there is no concept of chronic illnesses within the Hmong population, this study was aimed at developing education geared towards understanding chronic illness and preventing the long term consequences of hypertension, and helping these individuals be more compliant with their healthcare regimens. Information was collected at a health fair at the Tulsa Hmong New Year via a 12 questions survey. Based on the American Heart Association blood pressure categories, 9% of the participants had either hypertension stage 1 or 2, and 3.6% had hypertensive crisis. Majority of the participants were not aware of the risk factors associated with stroke (e.g. hypertension, diabetes, lifestyle, etc.). A high number of qualified appearing individuals refused to participate because they "did not want to know" what their blood pressure or FSBS values were. Although there are flaws in this pilot research study, it does show that more information and education is needed in this minority population.

Introduction

"Doctor, my husband did not have any health problems until his stroke. He is only 47, was doing well at home, and able to function without any problems. He was on no medications and never complained about pain or even a headache. He only smoked socially with friends, and he is not even a fat person. Since the stroke, he has not been able to communicate very much, let alone use the bathroom by himself. He is weak on his right leg and arm, and is wheelchair bound all day. They said he had high blood pressure at the hospital, but I just do not understand why he had a stroke."

Most patients with hypertension (HTN) do not have symptoms until their blood pressure (BP) is extremely elevated. A lot of patients either do not know they have HTN or do not think of the detrimental consequences of uncontrolled HTN; including stroke/cerebrovascular accidents (CVA), until it has already occurred. According to the American Heart Association (AHA), these are some of the risk factors that can potentially contribute to a CVA: physical inactivity, hyperlipidemia, family history, high sodium intake, HTN, obesity, diabetes, smoking, cardiac conditions, alcohol (ETOH) consumption, and drug abuse. Reduction and control of these risks factors are important to reduce the lifetime risk of CVA (1).

The Hmong people are a group of mountain tribe individuals originating from Southeast Asia. The many cultural and spiritual beliefs of the Hmong, along with a poor understanding of chronic medical conditions, and their strong mistrust of western medicine has made this minority group noncompliant with western medical treatment regimens. With no actual concept of chronic illness, these individuals often believe that if you have an illness, you either get cured, or you die (2,3,4,5).

Majority of the Hmong in the United States are located in Minnesota, California, and Wisconsin, with an estimated population of 272,825. There are many smaller Hmong communities throughout the United States, one of them being Oklahoma (6,7). Due to the growing Hmong population within Oklahoma, and the high rates of HTN overall, the aim of this study was to uncover the prevalence and perceptions about HTN, with the hope that it will guide culturally specific preventative care education within the Hmong population to improve patient care.

Methods

Participants
Subjects were recruited during the Tulsa Hmong New Year celebration on October 25 – 26, 2014 in Tulsa, Oklahoma. A health fair booth was set up to check BP and finger stick blood sugars (FSBS). Individuals were asked to be involved in the study, but did not have to participate in the study in order to obtain BP readings or FSBS readings.

Inclusion Criteria – Hmong individuals attending the Tulsa Hmong New Year celebration on October 25-26, 2014. Participants had to be ≥18 years, willing to participate in the study, and sign the informational consent form.

Exclusion Criteria – Individuals attending the celebration who were not of Hmong origin or who refused to participate in the study.

Data Collection
Participants were asked to answer a 12 question survey regarding their lifestyle and perceptions about HTN. The survey included their age, gender, current state they were residing in, the length of time since they last ate, and their recorded BPs and FSBSs from the health fair. BPs were measured using Welch Allyn's commercial automatic blood pressure cuff. Bayer Contour glucometers were used to detect FSBS levels. The survey was written in both English and Hmong. If participants were not able to read at all, Hmong assistants were able to read and helped them mark the answer choice.

Analysis
Data from the surveys were entered into Microsoft Excel and sent to Mark Payton, Ph.D., Oklahoma State University Regents Service Professor and Head of the Department of Statistics, for statistical analysis.

Results (Results are not statistically significant unless noted.)

Demographics
There were a total of 110 participants, 62 female, 40 male, and 8 did not indicate sex. The average age was 49 years, with a minimum age of 20 years and a maximum age of 97 years. 82% currently resided in Oklahoma, followed by 7% residing in Texas. The remaining 11% were from Colorado, Florida, Kansas, Michigan, Minnesota, and North Carolina.

BP Readings
9% of participants had either HTN stage 1 or 2, and 3.6% had hypertensive crisis according to the current AHA BP range guidelines (7). Independent of sex, the average systolic BP (SBP) was 124mmHg, with a minimum of 75mmHg and maximum of 183mmHg. The average diastolic BP (DBP) was 78mmHg, with a minimum of 52mmHg and maximum of 106mmHg. Females had a mean SBP of 122mmHg and DBP of 77mmHg. Males had a mean SBP of 126mmHg and DBP of 79mmHg.

FSBS Readings
The mean FSBS readings were 136mg/dL for females, and 132mg/dL for males. FSBS were directly correlated with BP measures.

Question 1: Do you drink alcohol?
19% of females and 33% of males drank alcohol. Independent of sex, 25% drank alcohol. Nine participants did not answer.

Question 2: Do you smoke?
1.85% of females and 0% of males smoked. Independent of sex, 1.2% smoked. 27 participants did not answer.

Question 3: Do you exercise regularly?
34.92% of females and 42.5% of males exercised regularly. Independent of sex, 37.86% exercised regularly. 7 participants did not answer.

Question 4: What do you usually eat?
BP was compared to the types of food intake as indicated by participants. 33% ate fried, fatty foods, with mean SBP of 122mmHg and DBP of 78mmHg. 77% ate vegetables, with mean SBP of 125mmHg and DBP 79mmHg. 31% ate fast food, with mean SBP of 127mmHg and DBP 80mmHg. 26% had a high salt diet, with mean SBP of 125mmHg and DBP 78mmHg. 25% ate sweets, with mean SBP of 123mmHg and DBP 77mmHg.

Question 5: Do you have a history of HTN, stroke, heart disease, diabetes, high cholesterol, and/or other?
BP was compared to the medical history as indicated by participants. 21% had HTN, with mean SBP of 134mmHg and DBP of 82mmHg. The SBP of participants who had HTN was statistically significant from participants who did not have HTN, p-value 0.0243. 1% had a stroke history, with mean SBP of 164mmHg and DBP of 105mmHg. SBP and DBP of participants who had a stroke history were statistically significant from participants who did not have a stroke history, p-values 0.0176 and 0.0039 respectively. It is important to note that only one out of the 110 participants had a history of stroke. 1% had heart disease, with mean SBP of 126mmHg and DBP of 86mmHg. 13% had diabetes, with mean SBP of 127mmHg and DBP of 80mmHg. 17% had high cholesterol, with mean SBP of 126mmHg and DBP of 79mmHg. 68% had other medical histories not specified, with mean SBP of 124mmHg and DBP of 79mmHg.

Question 6: Do you take medications for HTN, stroke, heart disease, diabetes, high cholesterol, and/or other?
BP was compared to medications that participants took for certain medical problems as listed. 13% took medications for HTN, with mean SBP 139mmHg and DBP 86mmHg. Both SBP and DBP of participants who took medications for HTN were statistically significant from participants who did not, p-value 0.0176 and 0.0311 respectively. 0% took medications for stroke. 0% took medications for heart disease. 13% took medications for diabetes, with mean SBP 127mmHg and DBP 80mmHg. 17% took medications for high cholesterol, with mean SBP 120mmHg and DBP 79mmHg. 68% took medications for other medical histories not specified, with mean SBP 124mmHg and DBP 79mmHg.

Question 7: Do you take herbal medications for HTN, stroke, heart disease, diabetes, high cholesterol, and/or other?
BP was compared to the herbal medications that participants took for certain medical problems as listed. 6% took herbal medications for HTN, with mean SBP 124mmHg and DBP 79mmHg. 1% took herbal medications for stroke, with mean SBP 152 and DBP 97. 0% took herbal medications for heart disease. 3% took herbal medications for diabetes, with mean SBP 116mmHg and DBP 74mmHg. 1% took herbal medications for high cholesterol, with mean SBP 120mmHg and DBP 73mmHg. 66% took herbal medications for other medical histories not specified, with mean SBP 124mmHg and DBP 79mmHg.

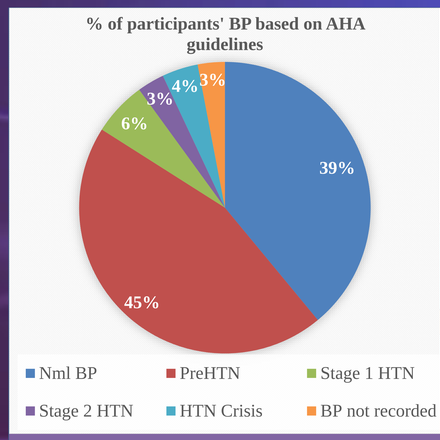
Question 8: Do you think it is important to control BP?
103 participants indicated that it was important to control BP, with mean SBP 124mmHg and DBP 78mmHg. Four participants indicated that it was not important to control BP, with mean SBP 130mmHg and DBP 85mmHg.

Question 9: Do you think having HTN is bad for your health?
104 participants indicated that having HTN was bad for their health, with mean SBP 124mmHg and DBP 78mmHg. Three participants indicated that having HTN was not bad for their health, with mean SBP 117mmHg and DBP 78mmHg.

Question 10: How often do you see a doctor?
SBP was not statistically different for participants whether they saw a doctor monthly (100mmHg), every few months (125mmHg), yearly (124mmHg), every few years (124mmHg), or never (126mmHg). DBP was statistically different, p-value 0.0112, when participants saw their doctor monthly (64mmHg), every few months (76mmHg), yearly and/or every few years (79mmHg and 78mmHg respectively), or never (82mmHg). DBP was not statistically different between participants who saw their doctors yearly (79mmHg) or every few years (78mmHg).

Question 11: Do you prefer herbal medicines or western medicine for treatment of your health conditions?
39.09% of participants preferred herbal medications. 73.64% preferred western medications.

Question 12: What do you think contributes to a stroke?
80% of participants believed that HTN contributed to strokes. 24.55% believed that heart disease contributed to strokes. 41.82% believed that diabetes contributed to strokes. 35.45% believed that high cholesterol contributed to strokes. 23.64% believed that alcohol and/or tobacco use contributed to strokes. 50% believed that other causes (stress) contributed to strokes. 25% believed that other causes (stress and food) contributed to strokes.



American Heart Association Blood Pressure Category	Systolic mmHg		Diastolic mmHg
Normal	<120	And	<80
PreHTN	120-139	Or	80-89
HTN Stage 1	140-159	Or	90-99
HTN Stage 2	≥160	Or	≥100
HTN Crisis	>180	Or	>110

Discussion

This pilot research study on prevalence and perceptions regarding HTN and its risk factors within the Hmong community in Tulsa, Oklahoma was small in number and not able to be generalized to other Hmong communities within the United States. The survey itself needed to be improved, and this was especially apparent during the data collection stage when participants either had a hard time understanding the questions or started writing other answers on the survey. The wording also needs to be simpler as well.

A large percentage of the data collected was not statistically significant with regards to BP. It did show that FSBS directly correlated with BP measurements. Participants who identified themselves as having HTN had statistically significant SBP compared to participants who did not self-identify as having HTN. Only one of the participants had a history of stroke, and this participant's BP was elevated (164/105mmHg). The participant did not have any apparent residual effects from the stroke, but from the health fair BP reading, the participant's BP continues to be uncontrolled.

Majority of participants were not aware of all the risk factors associated with CVA. Although 80% were aware that HTN can lead to strokes, <50% knew that diabetes, high cholesterol, and alcohol/tobacco use can also lead to CVAs. As noted above regarding the incompleteness of the survey, some participants did note that diet and stress can also contribute to strokes.

There were a high number of participants who did not answer the smoking question (25%) compared to ETOH (8%) and exercise (6%). There is no clear reason why this was the case, as the question was worded exactly the same as the others. Another interesting aspect during the recruitment phase that was unexpected, was the high number of qualified appearing individuals that refused to participate (even in the health fair portion) because they "did not want to know" what their BP or FSBS values were. These individuals indicated that if they did not know then it did not affect them. Hence, they would not have to stress about it until they felt sick. This behavior shows that more culturally sensitive and directed education is needed in the Hmong community.

Conclusion

The information and screening provided at the health fair was beneficial to the Hmong community in Tulsa. Educational handouts were prepared in both English and Hmong, and accessible to everyone. Verbal education regarding uncontrolled HTN and the known risks factors were provided if participants had further questions. The health fair opened the discussion regarding strokes, HTN, diabetes, and associated risk factors. Even after the health fair, the Hmong community continued to talk about the health fair and how helpful it was for them or their family member who participated.

Although there are flaws in this pilot research study, it does show that more information and education are needed in this minority population. Since there is no concept of chronic illnesses within the Hmong population, education geared towards understanding chronic illnesses and preventing their long term consequences would be beneficial in helping these individuals be more compliant with their healthcare regimen. Further studies could be conducted in the future, with the end goal making preventative care more culturally appropriate for the Hmong community.

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