consistent with a peripheral cause of vertigo (most commonly BPPV or Meniere’s Disease). In all other patients and in patients with sudden onset of severe vertigo, CT head should be strongly considered. Finally, elevated troponin in a patient with vertigo is a strong reason to perform a CT head, as elevated troponin can indicate intracerebral hemorrhage, subarachnoid hemorrhage, or ischemic stroke.

In this case the use of CT was justified for three major reasons, which were mentioned previously: 1) The patient’s rapid progression of symptoms (vertigo, nausea, and vomiting progressing to include headache and somnolence), 2) The patient’s stroke risk factors (ischemic: atrial fibrillation, type two diabetes mellitus, hypercholesterolemia, hypertension, and past history of an ischemic stroke; hemorrhagic: warfarin ingestion), and 3) The elevated troponin I.

References

Correspondence to Neil Dattani: 1 King’s College Cir, Toronto, ON M5S 1A8. Phone: (416) 978-6585. Email: nddattani@gmail.com

How Big is that Baby Bump? Learner Variation in Measuring Symphysis-Fundal Height

Allison Edwards, BSc; Ginetta Salvalaggio, MSc, MD, CCFP; Shelley Ross, PhD; Sudha Koppula, BSc, MD, MCISc, CCFP

1 Faculty of Medicine and Dentistry, University of Alberta, Edmonton
2 Department of Family Medicine, University of Alberta, Edmonton

Abstract

Background and Objectives: A decreasing number of Canadian family physicians are offering obstetrical care to their patients. Of those family physicians who do, many are doing so in group settings where maternity patients are cared for by multiple care providers. Therefore, it is necessary for training and practising family physicians to make accurate and reproducible prenatal measurements. This study investigates the inter- and intra-observer variability in symphysis fundal height (SFH) measurements among first year family medicine residents.

Methods: Three SFH measurements were taken by eight first year family medicine residents on pregnant patients between 26 and 38 weeks gestation from a low-risk primary care obstetrical practice. Measurements were made using unmarked measuring tapes and residents were blind to the patients’ gestational ages. Tapes were measured against a metal ruler standard and lengths recorded. Inter-observer variation was determined by calculating the mean inter-observer range of SFH measurements across all patients. Intra-observer variation was determined by calculating the mean intra-observer range across all patients.

Results: Mean inter-observer and intra-observer variations were 6.4 cm and 1.5 cm, respectively.

Conclusions: While residents can reliably reproduce their own SFH measurements these measurements are not consistent between residents. In order to ensure reliable continuity of SFH measurements among prenatal care providers, further research is needed to determine the ideal educational methods to teach residents how to accurately obtain SFH measurements. Doing so has the potential to maximize detection of fetal growth anomalies and may minimize the need for less cost-effective and less available resources, such as ultrasound.

Key Words: Education and/or Curriculum development, Clinical Education Methods, Prenatal care

Introduction

Comprehensive and regular prenatal care is an essential component of a healthy pregnancy in which family physicians play a key role. Routine prenatal care incorporates a range of tools and techniques that monitor fetal growth including serial measurements of symphysis-fundal height (SFH). Abnormalities of this parameter may suggest complications (e.g. large/small for gestational age, oligo/poly-hydramnios, structural abnormalities, etc.). Therefore, accuracy of the SFH measurement may reduce the unnecessary use of more costly and potentially less available resources, such as additional ultrasound studies. As a result, it is important for prenatal care providers, including family physicians and their trainees, to become skilled in this measurement.
Studies that determine inter-observer reliability situations of maternal obesity, uterine structural SFH measurements may not be accurate in knowledge of gestational age. Position, the measurement technique used, SFH measurements. These factors include have been noted to affect the accuracy of is unacceptably low. inter-observer reliability of this measurement. Many studies have determined that the inter-observer reliability of SFH measurements alone. Therefore, in the case of an individual prenatal care provider, it is valuable for SFH measurements to be reproducible but not necessarily correct.

In recent years, increasing numbers of family physicians have chosen to stop providing obstetrical care; in 2010, only 10% of family physicians offered their patients intrapartum care. Furthermore, the trend for family physicians who are interested in sustaining their obstetrical practice is to work in group care settings. Such group systems of care have multiple caregivers providing prenatal care to a single maternity patient. As each provider may have different SFH measurement techniques, the measurements made by these multiple providers may not be reproducible amongst each other. Therefore, trends in fetal growth may not be as evident as in the case of a single care provider. As a result, all care providers in group systems of care need to make SFH measurements that are reproducible amongst each other. This implies the need for improved inter-observer agreement between caregivers in order to obtain a more accurate reflection of growth trends and progress during a pregnancy.

There has been conflicting evidence regarding the inter-observer reliability of SFH measurements. Many studies have determined that the inter-observer reliability of this measurement is unacceptably low. Several factors have been noted to affect the accuracy of SFH measurements. These factors include the measurement technique used, maternal position, fetal position, and clinician knowledge of gestational age. In addition, SFH measurements may not be accurate in situations of maternal obesity, uterine structural abnormalities and high-risk pregnancies. Studies that determine inter-observer reliability to be low commonly attribute their unfavourable results to one of the above factors. Specifically, Crosby et al. predicted that their results may have been improved if specific protocols on how to take the measurement were in place. Furthermore, studies that did control for some factors by blinding patient gestational age, using unmarked measuring devices and using specific measurement techniques obtained better inter-observer agreement than studies that did not control for these factors.

As part of a review of family medicine resident maternity training needs in light of recent trends in maternity care, this study aimed to determine the inter- and intra-observer SFH agreement among family medicine residents.

Methods

This descriptive study was carried out during a pilot prenatal physical exam skills workshop attended by first-year family medicine residents who had recently begun a six-month rotation in family medicine with integrated obstetrical training. The small number of residents precluded a pre-/post-workshop comparison of precision and accuracy. The University of Alberta Health Research Ethics Board provided approval for this study.

Patient Participants

Patients attending two different University-affiliated maternity care clinics in Edmonton, Alberta, between July and August, 2011, were recruited to participate in the study. Patients included for recruitment were between 26 and 38 weeks of gestation, as dated by last menstrual period and confirmed by ultrasound prior to 22 weeks of gestation. Patients were excluded if significant uterine abnormalities were present, the patient had a multiple gestation pregnancy or the pregnancy was determined to be high risk, defined by a standard risk assessment on the Alberta Prenatal Record (2). Patients were recruited by a study investigator who was not involved in their prenatal care.

Family Medicine Resident Participants

Eight male and female residents between 20 and 65 years of age beginning their first year of the University of Alberta Family Medicine Residency program were recruited for the study by a study investigator not involved in their training or evaluation.

Procedures

Similar studies have been conducted in which examiners took multiple blinded measurements on a variety of prenatal care patients. For our study, measurements were taken using blank strips of paper measuring 45 cm x 1 cm. Each strip was labelled with a bold red line indicating the zero mark and the patient ID. One of the study investigators, an experienced family physician who provides low-risk obstetrical care, demonstrated to the residents the SFH measurement technique during a prenatal skills workshop. During the workshop, residents were instructed to take measurements as taught during the workshop, i.e. from the uppermost border of the pubic symphysis to the uppermost border of the uterine fundus in the midline of the abdomen. The tape was to maintain complete contact with the skin of the abdomen. Measurements were taken using a blank paper strip and each measurement was indicated by having the resident tear the paper at the point at which they felt the measurement to be most accurate. After each measurement was taken, participants were instructed to place the paper strip into an envelope marked with their study ID number before measuring with a new strip. Residents were instructed to take three separate measurements per patient in this fashion. Strips were collected and compared against a metal ruler standard by a different study investigator and all strips were measured on one occasion. As tears were often obliquely oriented, the shortest length of the strip was assumed to be the obtained SFH measurement on all strips and this length was recorded to the nearest 0.5 cm.

The same study investigator who demonstrated the SFH measurement technique also took measurements on all patients to serve as a gold standard comparison. Both residents and the gold standard physician were blinded to the patients’ gestational age and BMI and used blank measuring strips.

Data Analysis

Inter-observer variation was calculated by determining the range of measurements made by residents for each patient as well as the mean range across all patients. The inter-observer range of measurements for each patient was defined as the [maximum measurement made by all residents for one patient] – [minimum measurement made by all residents for the same patient]. The mean inter-observer range of measurements for all patients was defined as the average of the inter-observer range obtained for each patient in the study.

Intra-observer variation was calculated by determining the range of the three measurements made by each resident on each
patient, as well as the mean range of each resident's measurement on all patients. The intra-observer range of measurements for each patient was defined as the [maximum measurement made by one resident for one patient] – [minimum measurement made by the same resident for the same patient]. The mean intra-observer range was defined as the average of the intra-observer range obtained for each patient in the study.

Results

Participant demographics
The four patients who participated in the study were between 30 and 34 years of age, with a mean of 32.5 years old. Three (75.0%) patients were nulliparous and one (25.0%) was primiparous. Patients were between 28 and 38 weeks gestation, with a mean of 34.5 weeks (SD = 4.51). Height varied from 160.0 cm to 177.8 cm, with a mean of 165.8 cm (SD = 8.13). Weight varied between 63.2 kg and 95.3 kg, with a mean of 78.7 kg (SD = 13.19). BMI varied from 23.9 kg/m² to 36.0 kg/m², with a mean of 28.8 kg/m² (SD = 4.75).

The eight residents who participated were between 25 and 31 years of age, with a mean of 27.1 years old. Four (50%) of the residents were male and four (50%) were female. All participants had the same level of training but one had graduated from medical school greater than one year earlier and one felt she had greater experience in maternity care than a standard medical graduate due to interest and electives taken.

Intra- and Inter-observer variation
Average resident measurements and intra- and inter-observer variation for each patient are presented in Table 1 and Figures 1 through 4. The intra-observer variation of each resident's three measurements on each patient varied from 0.8 cm to 2.4 cm, with a mean of 1.5 cm. The inter-observer variation among residents for each patient varied from 4.8 cm to 7.2 cm, with a mean of 6.4 cm. The relationship between BMI and gestational age was not consistent with the range of measurements obtained for each patient. Nevertheless, the patient with the lowest BMI and lowest gestational age did have the lowest inter-observer variation.

Discussion
These findings suggest that residents have excellent intra-observer agreement in their SFH measurements (mean intra-observer variation 1.5cm) but poorer inter-observer agreement (mean inter-observer variation 6.4cm). This is consistent with previous studies that found intra-observer variation in measurements to be low compared with inter-observer variation. Engstrom et al. found that the mean difference between examiners' measurements was 2.06 cm while the mean difference between individual examiner's measurements was 1.13 cm. Similarly, Calvert et al. found the intra-observer coefficient of variation in SFH measurements to be 4.6% while the inter-observer coefficient of variation in SFH measurements was 6.4%.

Rogers et al. also found inter-observer variation to be low at 0.66 cm. The difference in findings can likely be explained by differences in study design, participant number and experience of examiners. While these studies had high participant numbers and examiners were experienced in taking SFH measurements, these studies did not use unmarked measuring tapes and only one blinded gestational age. As a result, they may not show the true inter-observer variation in SFH measurements among their participants. This fact may account for the difference in magnitude of inter-observer variation found in the present study compared with previous studies.

Intra-observer range of measurements for each patient in the study.

Table 1 and Figures 1 through 4 present the intra-observer variation of each resident's measurement on all patients. The inter-observer variation for each patient is defined as the [maximum measurement made by one resident for one patient] – [minimum measurement made by the same resident for the same patient]. The mean inter-observer range was defined as the average of the inter-observer range obtained for each patient in the study.

Conclusions
This study indicates that residents are in need of additional education on how to obtain reproducible SFH measurements. Improving the skill of family medicine learners may lead to more timely detection of fetal growth anomalies and may reduce the need for unnecessary and less cost effective methods of fetal growth assessment. It is particularly important for their skill to improve should these learners choose to follow the current trend of family physicians and practice obstetrical care in physician groups. Thus, the need for reproducibility in SFH measurements is immediate. In order to address this need, further research into the educational methods to instruct residents how to reproducibly obtain SFH measurements is required.

Acknowledgements
The authors would like to thank the Division of Medical Studies, Faculty of Medicine and Dentistry, University of Alberta, for providing student funding to complete this project.

References
9. Calvert JP, Creen EA, Newcombe RG, Pearl...
was 2.3 cm. GS = gold standard clinician measurement.

25.2). Inter-observer variation on this patient was 7.2 cm, intra-observer variation was 1.2 cm. GS = gold standard clinician measurement.

Figure 1. Resident and clinician SFH measurements on Patient A (38 weeks, BMI 29.8). Inter-observer variation on this patient was 7.0 cm, intra-observer variation was 1.3 cm. GS = gold standard clinician measurement.

Patient A

Patient B

Patient C

Patient D

Figure 2. Resident and clinician SFH measurements on Patient B (27 weeks, BMI 36.0). Inter-observer variation on this patient was 6.5 cm, intra-observer variation was 1.1 cm. GS = gold standard clinician measurement.

Figure 3. Resident and clinician SFH measurements on Patient C (35 weeks, BMI 25.2). Inter-observer variation on this patient was 7.2 cm, intra-observer variation was 2.3 cm. GS = gold standard clinician measurement.

Figure 4. Resident and clinician SFH measurements on Patient D (28 weeks, BMI 23.9). Inter-observer variation on this patient was 4.8 cm, intra-observer variation was 1.2 cm. GS = gold standard clinician measurement.
MUSA

As Your Nurse

Claire S. Allen
Medical Student (2016), Faculty of Medicine and Dentistry, University of Alberta
Faculty of Nursing, University of Calgary

We meet in the morning
At 7:30 shift change
You are my patient
And I am your nurse

Our uniforms make this distinction
My scrubs and your gown
They dictate our roles
Lest we forget

Our first interactions
Will be awkward and clumsy
Like the first dance shared by two strangers
Until they establish a rhythm

Our relationship, dysfunctional by most standards
I will inflict pain yet console you
And my self worth will be based on your affirmation
I don’t mind if you don’t

I promise to return your dignity
Each time I strip it away
So don’t hesitate to call
When you need help off the toilet

If the care I provide is lacking
The system you will blame
And your bad-temper, I attribute to pain
We will hold each other in the highest regard
My charting, a legal requirement
Will contain the most private of information
Yet it will be dry and objective
And represent neither of our experiences

When it is time for you to go home
Our words will be empty, but our eyes will smile
I hope to never see you again under such circumstances
Where I am your nurse, and you are my patient

Correspondence information: Claire Allen
csallen@ualberta.ca

A Quality Education

Alim Nagji, M.D. B.H.Sc.
PGY-1 Family Medicine, University of Alberta

There’s no sound in the room. The air hangs heavy, like a dense fog that sinks down. It covers the lower levels, obscuring the view from the third floor. As I gaze through the massive framework down into the abyss the two floors seem like an eternity to fall. The soft light from the skylight is twisted, fragmented by the thick layer of amorphous ice that covers the glass. I trace the unique patterns, following the cracks and wondering if one day the ice will finally give way, releasing a cascade of glass and air and a whiff of freedom; life outside the catacombs awaits. But silence reigns king here. I long to throw something, to shout, disturb the stillness. To break spines and disrupt lines, leaving stories untold and formulas unsolved. I long for control. But alas, this is the life I have chosen. I often wonder had I known this is what it means to be well educated, to spend my days trapped in a library, would I have made the same choice? Is education really confined to these hallowed halls and whitewashed walls? Can it only be a transfer of energy from the unperturbed professors to the ritalin-filled students? These questions are left unasked in lectures; the answers, never spoken aloud.

I descend, deeper into the cave, taking the stairs slowly, each step resonating over the restrained crowd. A stirring of papers, the gulping of coffee and the tapping of a pencil join me to form a sober harmony. I sit behind a cubicle that engulfs my peripheral vision and hunker down to study; my only solace the tinny sound from my headphones and the only personal contact was when I asked someone to watch my things.

Correspondence information: Alim Nagji
anagi@gmail.com