Pseudo-uterine Contractions: A New Entity in Obstetrics

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ABSTRACT **Background:** Listening to patients and obtaining a thorough history are fundamental in clinical practice. Some pregnant women, particularly in late or preterm gestation, report regular, painful uterine contractions that may not correspond to true labor. In some cases, patients admitted to feigning contractions using the Valsalva maneuver to gain secondary benefits. Misdiagnosing such cases may lead to unnecessary interventions, including iatrogenic prematurity.

Objectives: To explore the phenomenon of pseudo-uterine contractions and assess whether maternal heart rate (HR) can help differentiate them from true contractions.

Methods: We performed a prospective case-crossover study, which included 30 pregnant women in their third trimester who presented to Rambam Health Care Campus. Participants underwent 20 minutes of standard external monitoring followed by 10 minutes of repeated Valsalva maneuvers (every 2 minutes). Maternal and fetal HRs were recorded and compared during baseline, pseudo-uterine, and true contractions.

Results: During pseudo-contractions, maternal HR decreased by approximately 10 bpm ($P < 0.001$), while fetal HR increased by 8 bpm ($P < 0.001$). In contrast, true contractions resulted in a maternal HR increase of 15 bpm ($P < 0.001$) and a fetal HR rise of 12 bpm ($P < 0.001$).

Conclusions: Maternal HR patterns differ significantly between true and false contractions. A decline in maternal HR during contractions may indicate Valsalva-induced pseudo-contractions, while an increase suggests true labor. This simple observation could aid in preventing unnecessary interventions in suspected cases.

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KEY WORDS: false uterine activity, pregnancy, tocodynamometer, uterine contractions, Valsalva maneuver

Factitious disorder and malingering represent distinct categories within the spectrum of feigned illness presentations. Both involve the deliberate simulation of medical conditions, but they differ in conscious intent and underlying motivation. Malingering is a conscious behavior aimed at achieving secondary gain, whereas factitious disorder is an unconscious behavior serving the purpose of receiving medical attention [1]. Both conditions are prevalent, complex, and intriguing behaviors occasionally encountered by medical physicians [2].

Malingering disorders may be further classified into three categories: pure, when non-existent clinical problems are feigned; partial, when actual symptoms are exaggerated; and false, referring to the deliberate misattribution of real symptoms to a compensable event [3]. Physicians must remain vigilant, as many medical conditions may be malingered [4]. A review of 33,531 annual neuropsychology cases reported estimated rates of malingering and symptom exaggeration ranging from 8% of medical and psychiatric cases, to as high as 30% of those seeking disability or workers compensation [5].

Uterine contractions are complex, synchronized events triggered by hormonal and local mediators acting on the myometrium [6]. This myometrial activity may herald the onset of labor, including preterm delivery [7].

Several techniques exist for assessing uterine activity, ranging from noninvasive methods such as manual palpation [8,9], tocodynamometry (TOCO), and electrohysterography (EHG), to the gold-standard invasive technique of intrauterine pressure catheterization (IUPC) [10]. TOCO, the most widely used method, consists of an external transducer with a spring-loaded piston, secured against the patient's abdominal wall with an elastic belt over the maternal fundus. Uterine contractions alter the abdominal contour, displacing the piston, which is registered as a contraction [11,12]. Despite its practical advantages, TOCO has limitations. It can only assess contraction frequency, not intensity [11], and its signals are often difficult to interpret [12]. In addition, factors such as the Valsalva maneuver, which increase intra-abdominal pressure, may be detected during feto-maternal monitoring [13].

Figure 1. Fetal monitoring of a 32-year-old patient at 30.1 weeks of her second gestation She was hospitalized at our feto-maternal unit for recurrent episodes of premature uterine contractions. An example of a fetal monitor with suspected pseudo-uterine contractions

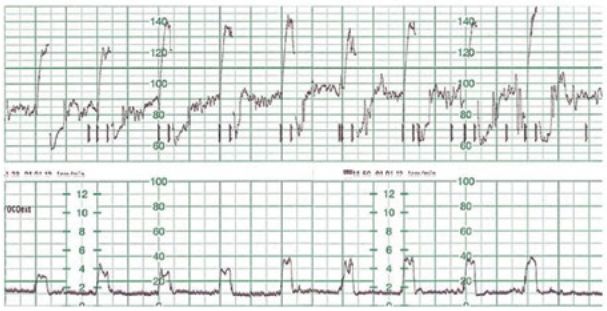
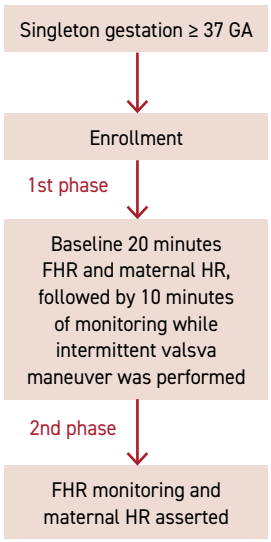


Figure 2. Patient evaluation flow-chart



FHR = fetal heart rate, GA = gestational age, HR = heart rate

Table 1. Demographic and clinical characteristics and study population

	Study population, n=32
Demographics	
Maternal age in years, mean ± SD	31.13 ± 5.15
Gestational age at recruitment, mean ± SD	39.23 ± 1.19
Gestational age at delivery, mean ± SD	39.72 ± 1.20
Clinical	
Gravity, mode (%)	1 (31.3%)
Parity, mode (%)	0 (34.4%)
BMI, mean ± SD	30.28 ± 4.86
Smoking during pregnancy, n (%)	3 (9.4%)

Based on clinical experience [Figure 1], we hypothesized that a subset of pregnant women may utilize this common maneuver to simulate factitious preterm or term contractions possibly for secondary gain or, alternatively, as an unconscious act to obtain medical attention. A secondary gain could include work avoidance or obtaining bed rest, depending on local insurance policies. To the best of our knowledge, the phenomenon of factitious uterine contractions has not yet been described in medical literature.

The aim of the present study was to determine whether the Valsalva maneuver performed by pregnant women produces signals on TOCO that may be misinterpreted as uterine contractions, while paying particular attention to maternal heart rate (HR) as a possible marker to differentiate between true and pseudo-contractions.

PATIENTS AND METHODS

STUDY DESIGN

We conducted a prospective case-crossover study at Rambam Health Care Campus, Haifa, Israel. Pregnant women at term (≥ 37 weeks gestation) presenting for antenatal evaluation were recruited. Each participant underwent 20 minutes of baseline external fetal heart rate (FHR) monitoring, followed by 10 minutes of monitoring during which they performed the Valsalva maneuver every 2 minutes. Maternal and fetal HR during Valsalva maneuvers were compared with those recorded during true uterine contractions in the same patient during the latent phase of labor [Figure 2].

PATIENT ELIGIBILITY

The study was approved by the local ethics committee (0264-21-RMB), and written informed consent was obtained from each participant. Thirty pregnant women were enrolled, all of whom subsequently delivered at Rambam Health Care Campus.

Inclusion criteria included singleton term pregnancies without regular uterine contractions. Exclusion criteria included maternal age < 18 years, gestational age < 37 weeks, known fetal anomalies, multiple gestation, and obstetric complications (e.g., gestational diabetes, gestational hypertension, prior cesarean section).

STATISTICAL ANALYSIS

Based on prior data showing HR differences between first and second stages of labor, we calculated a sample size of eight women to detect a 35 ± 13 BPM change [13]. To strengthen statistical power, we recruited 30 women.

Table 2. Comparison of maternal and fetal heartrate

	Baseline	Pseudo-contraction	Ture contraction	*P*-value
Maternal heart rate, BPM, mean ± SD	87.67 ± 9.89	80.13 ± 8.58	101.57 ± 14.47	< 0.001
Fetal heart, BPM, mean ± SD	136.00 ± 6.22	142.33 ± 8.68	146.50 ± 13.78	0.001

BPM = beats per minute, SD = standard deviation

Mean HRs were compared between study phases using the Wilcoxon test for paired samples. Demographic data (age, gravidity, parity, gestational age, BMI, and smoking status) were also analyzed [Table 1].

RESULTS

PARTICIPANT CHARACTERISTICS

Table 1 summarizes maternal demographics and clinical characteristics. The mean maternal age was 31.13 ± 5.15 years. The mean gestational age at recruitment was 39.23 ± 1.19 weeks, increasing to 39.72 ± 1.20 weeks at delivery. Primigravidas comprised 31.3% of participants. Mean BMI at recruitment was 30.28 ± 4.86, and 9.4% reported smoking during pregnancy.

HEART RATE ANALYSIS

Table 2 presents maternal and fetal HR measurements during baseline, pseudo-contraction, and true contraction states, with corresponding *P*-values. Baseline maternal HR was 87.67 ± 9.89 BPM; and FHR was 136.00 ± 6.22 BPM. Pseudo-contractions of maternal HR decreased to 80.13 ± 8.58 BPM; yet FHR increased to 142.33 ± 8.68 BPM. For true contractions, maternal HR increased to 101.57 ± 14.47 BPM and FHR further increased to 146.50 ± 13.78 BPM. All changes were statistically significant ($P < 0.001$). Maternal HR showed consistent differences across baseline, pseudo-contractions, and true contractions ($P < 0.001$).

DISCUSSION

This study highlights the entity of pseudo-uterine contractions and proposes maternal HR as a distinguishing marker.

Although malingering for secondary gain has been reported in medicine [14], its application to obstetrics remains largely unexplored. Physicians face challenges diagnosing malingering, as medical training emphasizes recognition of genuine disease rather than deception [15]. Our findings may provide obstetricians with a practical tool for distinguishing true from feigned uterine contractions, reducing diagnostic uncertainty.

We found that true contractions were associated with an approximate 15 BPM increase in maternal HR compared to baseline, whereas pseudo-contractions induced by the Valsalva maneuver were associated with a 10 BPM decrease. This distinction may assist clinicians in real-time evaluation.

The financial burden of malingering is substantial: in the United States, annual compensation for malingering is approximately $20 billion [16]. Within the Israeli context, the National Insurance Law (Section 58) [17] grants benefits to women diagnosed with high-risk pregnancies including work exemption and pregnancy retention allowance [18]. Section 7 of the Women's Employment Law further protects seniority rights during pregnancy-related absences [19]. Such provisions may create incentive structures for feigning contractions, although applicability varies internationally.

A 2019 meta-analysis demonstrated that maternal HR rises progressively through pregnancy, averaging 79.3 BPM at 10 weeks and 86.9 BPM at 40 weeks [20]. Our study focused exclusively on women in their third trimester and thus may not generalize to earlier gestation. Moreover, exclusion of women with multiple pregnancies and obstetric complications limits the applicability of our findings to those populations.

CONCLUSIONS

In this study, we introduced the concept of pseudo-uterine contractions and proposed maternal HR monitoring as a practical tool to aid differentiation from true contractions. Greater awareness of factitious presentations in obstetrics may prevent misdiagnosis, ensure appropriate care, and optimize allocation of healthcare resources. Future research should expand to earlier gestational ages and higher-risk populations.

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People's memories are maybe the fuel they burn to stay alive.

Haruki Murakami (Born 1949), Japanese writer

Capsule

Sirt6 prevents the age-related decline of H_2S through the control of one-carbon metabolism

Touitu and colleagues explored a molecular mechanism underlying the prolongevity activity of the Sirt6 enzyme in supporting healthy aging. They showed that Sirt6 maintains youthful hepatic levels of hydrogen sulfide (H_2S), a gasotransmitter linked to the benefits of caloric restriction, by regulating cystine uptake and methionine metabolism. Sirt6 also prevents age-related increase in S-adenosylmethionine (SAM), the main methyl donor for epigenetic and protein methylation, through posttranslational acetylation. In addition, the authors defined a link between one-carbon metabolism and the transsulfuration pathway. These findings revealed a mechanism of Sirt6 action and suggested potential therapeutic targets to support healthy aging. The authors showed that Sirt6 controls hepatic one-carbon metabolism, preventing the aging-dependent H_2S reduction, and the elevation of the methyl donor, S-adenosylmethionine (SAM). Sirt6 downregulates Slc7a11 expression in an Sp1-dependent manner, decreasing cystine uptake and increasing Cgl H_2S production activity. In addition, comparative acetylome in old livers revealed Sirt6-related differential acetylation of most of the one-carbon enzymes. Specifically, Sirt6-dependent Matα1 K235 deacetylation reduces its SAM production activity and Cbs binding, thereby reducing its activation of Cbs-dependent H_2S production. The net outcome is H_2S and SAM levels as observed in young animals.

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