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# Antenatal ctg nice guidelines

Working off campus? Learn about our Remote Access Options Volume 96, Question 2 Conflict of Interest: The authors explicitly stated that there are no conflicts of interest in relation to this article. One of the limitations reported with cardiotocography is the modest interobserver agreement observed in the interpretation of screening. This study compared agreement, reliability and accuracy of cardiotoctography interpretation using the International Federation of Gynecology and Obstetrics, American College of Obstetrics and Gynecology, and guidelines from the National Institute for Health and Care Excellence. A total of 151 screenings were evaluated by 27 physicians from three centers where the International Federation of Gynecology and Obstetrics, the American College of Obstetrics and Gynecology and the National Institute for Health and Care Excellence were routinely used. The interobserver agreement was evaluated using the proportions of agreement and reliability with κ statistics. The accuracy of screenings classified as pathological/category III was evaluated for prediction of newborn acidemia. For all measurements, a 95% confidence interval was calculated. Cardiotocography classifications were more distributed with the International Federation of Gynecology and Obstetrics (9, 52, 39%) and National Institute of Excellence in Health and Care (30, 33, 37%) than with the American College of Obstetrics and Gynecology (13, 81, 6%). The category with the highest agreement was the American College of Obstetrics and Gynecology category II (proportions of agreement = 0.73, confidence interval of 95% 0.70-76), and the ones with the lowest agreement were the Categories American College of Obstetrics and Gynecology I and III. Reliability was significantly higher with the International Federation of Gynecology and Obstetrics (κ = 0.37, 95% confidence interval 0.31-0.43) and National Institute of Excellence in Health and Care (κ = 0.33, 95% confidence interval 0.28-0.39) than with the American College of Obstetrics and Gynecology (κ = 0.15, 95% confidence interval 0.10-0.21); however, they all represent only light/fair reliability. The International Federation of Gynecology and Obstetrics and the National Institute of Excellence in Health and Care showed a tendency towards greater sensitivities in the prediction of newborn acidemia (89 and 97%, respectively) than the American College of Obstetrics and Gynecology (32%), but the latter achieved a significantly higher specificity (95%). With the guidelines of the American College of Obstetrics and Gynecology there is high agreement in category II, low reliability, low sensitivity and high specificity in the prediction of acidemia. With the guidelines of the International Federation of Gynecology and Obstetrics and the National Institute of Excellence in Health and Care, there is greater reliability, a tendency towards greater sensitivity and lower specificity in the prediction of ACOG American College of Obstetrics and Gynecology CTG cardiotocography FHR fetal heart rate FIGO International Federation of Gynecology Gynecology Obstetrics NICE National Institute for Health and Care Excellence AS proportions of agreement, reliability and accuracy of cardiotoctography interpretation using the FIGO, ACOG and NICE guidelines are compared. The study demonstrates significant differences between these three main classification systems that are important for the development of future guidelines. Cardiotocography (CTG) is an integral part of intraparo care in most high-income countries. However, one of its limitations is the modest interobserver agreement in the interpretation ctg 1-5. The International Federation of Gynecology and Obstetrics (FIGO) published its first guidelines on fetal heart rate monitoring (HRF) in 1987 6 and established the only international consensus available at the time of the present study. Many national scientific organizations have also published guidelines on the subject, but perhaps those with the greatest impact were developed by the American College of Obstetricians and Gynecologists (ACOG) and the National Institute of Excellence in Health and Care (NICE). ACOG published several revised versions of its original publication in 1974 7, the last of which, in 2010, was associated with the National Institute of Child Health and Human Development and the Society of Maternal-Fetal Medicine 8. The Royal College of Obstetricians and Gynaecologists published its first guidelines in 2001, and updated them in 2007 in association with NICE 9. This was the most recent version available at the time the present study was conducted. These three guidelines have important differences, not only in the definition of individual characteristics of the CTG, but also in the criteria used for general classification of screening (Tables 1 and 2) 10. The aim of this study was to compare interobserver agreement, reliability and accuracy of ctg analysis, when performed according to figo, ACOG and NICE guidelines. The hypothesis was that differences in the structure of the guideline, as well as in the clarity and complexity of definitions, could result in different interobserver agreements, and in different predictive capacities for interpretation of CTG. A second hypothesis was that the observers' experience would have an additional impact on these findings. Table one. Comparison of the basic definitions of fetal heart rate (HRF) contained in the guidelines of the International Federation of Gynecology and Obstetrics (FIGO) of 1987, the 2010 American College of Obstetricians and Gynecologists (ACOG) guidelines and the 2007 National Institute for Health and Care Excellence (NICE) guidelines baseline FIGO Baseline FHR is the average level of the FHR when it is stable, accelerations and decelerations absent. It is determined over a time period of 5 or 10 min and expressed in beats/min (bpm) FHR average level when stable, excluding accelerations and decelerations. It is determined over a period of time 5 or 10 min and expressed in ACOG Medium FHR bpm rounded to for of 5 bpm during a 10-min segment, excluding: periodic or episodic changes, periods of marked FHR variability, segments of baseline that differ >25 bpm Normal baseline FIGO 110–150 bpm NICE 110–160 bpm ACOG 110–160 bpm Tachycardia FIGO (no definition) NICE >180 bpm (161–180 bpm is moderate tachycardia) ACOG >160 bpm Bradycardia FIGO <80 bpm= nice=></80> <100 bpm= (100–109= bpm= is= moderate= bradycardia)= acog=></100> <110 bpm= variability= figo= oscillations= of= fhr= around= its= mean= level= (long-term= variability).= this= is= usually= only= quantified= by= description= of= the= amplitude= of= the= oscillations= around= the= baseline= heart= rate= nice= the= minor= fluctuations= in= baseline= fhr= occurring= at= three= to= five= cycles= per= minute.= it= is= measured= by= estimating= the= difference= in= bpm= between= the= highest= peak= and= lowest= trough= of= fluctuation= in= a= 1-min= segment= of= the= trace= acog= fluctuations= in= the= baseline= fhr= that= are= irregular= in= amplitude= and= frequency.= it= is= visually= quantified= as= the= amplitude= of= peak-to-trough= in= bpm= normal= variability= figo= between= 5= and= 25= bpm= nice= ≥5= bpm= between= contractions= acog= amplitude= range= 6–25= bpm= (moderate= variability)= reduced= variability= figo=></110> <5 bpm= for=>40 min (suspicious if variability 5–10 bpm for >40 min) NICE <5 bpm= for= 40–90= min= (non-reassuring)= or=>90 min (abnormal variability) ACOG Amplitude range ≤5 bpm (minimal variability) Increased variability FIGO >25 bpm NICE – ACOG Amplitude range >25 bpm (marked variability) Accelerations FIGO Transient increase in heart rate of ≥15 bpm and lasting ≥15 s NICE Transient increases in FHR of ≥15 bpm and lasting ≥15 s ACOG A visually apparent abrupt increase (onset to peak in <30 s)= in= the= fhr.= beyond= 32= weeks= of= gestation ,= an= acceleration= has= a= peak= of= ≥15= bpm= above= the= baseline,= with= a= duration= of= ≥15= s= but=></30> <2 min= from= onset= to= return.= prolonged= accelerations= last= ≥2= min= but=></2> <10 min= decelerations= figo= transient= episodes= of= slowing= of= fhr= below= the= baseline= level= of=>15 bpm and lasting ≥10 s or more NICE Transient episodes of slowing of FHR below the baseline level of >15 bpm and lasting ≥15 s or more ACOG – Early decelerations FIGO – NICE Uniform, desaceleração repetitiva e periódica da FHR com início precoce na contração e retorno à linha de base no final da contração ACOG Visualmente aparente geralmente diminuição gradual simétrica e retorno da FHR associada a uma contração uterina. Uma diminuição gradual é definida a partir do início ao nadir FHR de ≥30 s. A diminuição do FHR é calculada desde o início até o nadir da desaceleração. A nadir da desaceleração ocorre ao mesmo tempo que o pico da contração. Na maioria dos casos, o início, o nadir e a recuperação da desaceleração coincidem com o início, pico contraction end, respectively late decelerations FIGO – NICE Uniform, repetitive, periodic deceleration of the FHR with average start to the end of the contraction and nadir >20 after the peak of the contraction and end after the contraction. In the presence of a non-accelerated </10> </5> </5> </5> com variabilidade de linha de base <5 bpm,= the= definition= would= include= decelerations=></5> <15 bpm= acog= visually= apparent= usually= symmetrical= gradual= decrease= and= return= of= the= fhr= associated= with= a= uterine= contraction.= a= gradual= decrease= is= defined= as= from= the= onset= to= the= fhr= nadir= of= ≥30= s.= the= decrease= in= fhr= is= calculated= from= the= onset= to= the= nadir= of= the= deceleration.= the= deceleration= is= delayed= in= timing,= with= the= nadir= of= the= deceleration= occurring= after= the= peak= of= the= contraction.= in= most= cases,= the= onset,= nadir,= and= recovery= of= the= deceleration= occur= after= the= beginning,= peak,= and= ending= of= the= contraction,= respectively= variable= decelerations= figo= –= nice= variable,= intermittent= periodic= slowing= of= fhr= with= rapid= onset= and= recovery.= time= relationships= with= contraction= cycle= are= variable= and= they= may= occur= in= isolation.= sometimes= they= resemble= other= types= of= deceleration= patterns= in= timing= and= shapea= acog= visually= apparent= abrupt= decrease= in= fhr.= an= abrupt= decrease= is= defined= as= from= the= onset= of= the= deceleration= to= the= beginning= of= the= fhr= nadir= of=></15> <30 s.= the= decrease= in= fhr= is= calculated= from= the= onset= to= the= nadir= of= the= deceleration.= the= decrease= in= fhr= is= ≥15= bpm,= lasting= ≥15= s,= and=></30> <2 min= in= duration.= when= variable= decelerations= are= associated= with= uterine= contractions,= their= onset,= depth,= and= duration= commonly= vary= with= successive= uterine= contractions= prolonged= decelerations= figo= –= nice= an= abrupt= decrease= in= fhr= to= levels= below= the= baseline= that= lasts= at= least= 60–90= s.= these= decelerations= become= pathological= if= they= cross= two= contractions= (i.e.=>3 min) ACOG Diminuição visualmente aparente no FHR abaixo da linha de base. Diminuição da FHR da linha de base que é ≥15 bpm, <10 min= in= duration.= if= a= deceleration= lasts= ≥10= min,= it= is= a= baseline= change= sinusoidal= pattern= figo= regular= cyclic= changes= in= the= fhr= baseline,= such= as= the= sine= wave.= the= characteristics= of= the= pattern= being:= the= frequency= is=></10> <6 cycles/min, the amplitude is at least 10 bpm and the duration should be ≥20 min NICE A regular oscillation of the baseline long-term variability resembling a sine wave. This smooth, undulating pattern, lasting at least 10 min, has a relatively fixed period of three to five cycles per minute and an amplitude of 5–15 bpm above and below the baseline. Baseline variability is absent ACOG Visually apparent, smooth, sine wave-like undulating pattern in FHR baseline with a cycle frequency of three to five per minute which persists for ≥20 min a The NICE guidelines also define “atypical variable decelerations” when the following additional components are found: loss of primary or secondary rise in rate, slow return to baseline FHR after the end of a contraction, prolonged secondary rise in baseline rate, biphasic deceleration, loss of variability during deceleration, continuation of baseline rate at lower level. Bpm, beats per minute. Adapted from Ayres-de-Campos D, Bernardes J. Twenty-five years after the FIGO guidelines for the use of cycles/min,= the= amplitude= is= at= least= 10= bpm= and= the= duration= should= be= ≥20= min= nice= a= regular= oscillation= of= the= baseline= long-term= variability= resembling= a= sine= wave.= this= smooth,= undulating= pattern,= lasting= at= least= 10= min,= has= a= relatively= fixed= period= of= three= to= five= cycles= per= minute= and= an= amplitude= of= 5–15= bpm= above= and= below= the= baseline.= baseline= variability= is= absent= acog= visually= apparent,= smooth,= sine= wave-like= undulating= pattern= in= fhr= baseline= with= a= cycle= frequency= of= three= to= five= per= minute= which= persists= for= ≥20= min= a= the= nice= guidelines= also= define= “atypical= variable= decelerations”= when= the= following= additional= components= are= found := loss= of= primary= or= secondary= rise= in= baseline= rate,= slow= return= to= baseline= fhr= after= the= end= of= a= contraction,= prolonged= secondary= rise= in= baseline= rate,= biphasic= deceleration,= loss= of= variability= during= deceleration,= continuation= of= baseline= rate= at= lower= level.= bpm,= beats= per= minute.= adapted= from= ayres-de-campos= d,= bernardes= j.= twenty-five= years= after= the= figo= guidelines= for= the= use= of=></6 cycles/min, the amplitude is at least 10 bpm and the duration should be ≥20 min NICE A regular oscillation of the baseline long-term variability resembling a sine wave. This smooth, undulating pattern, lasting at least 10 min, has a relatively fixed period of three to five cycles per minute and an amplitude of 5–15 bpm above and below the baseline. Baseline variability is absent ACOG Visually apparent, smooth, sine wave-like undulating pattern in FHR baseline with a cycle frequency of three to five per minute which persists for ≥20 min a The NICE guidelines also define “atypical variable decelerations” when the following additional components are found: loss of primary or secondary rise in baseline rate, slow return to baseline FHR after the end of a contraction, prolonged secondary rise in baseline rate, biphasic deceleration, loss of variability during deceleration, continuation of baseline rate at lower level. Bpm, beats per minute. Adapted from Ayres-de-Campos D, Bernardes J. Twenty-five years after the FIGO guidelines for the use of > durando ≥2 min, mas</2> mas</2> monitoring: time for a simplified approach? Int J Gynaecol Obstet. 2010;110:1-6. Table two. Comparison of cardiotocography classification criteria (CTG) in FIGO, Nice and ACOG guides FIGO NICE ACOG Normal Standard Base heart rate between 110 and 150 bpm Heart rate variability range between 5 and 25 bpm Normal (a CTG where all four comforting features are present) Baseline rate: 110–- 160 bpm variability: ≥5 bpm No decelerationaccelerations : this Category I (category I FHR strokes include all of the following) Baseline rate: 110-160 bpm Baseline variability: 6-25 bpm Age or variable decelerations: absent Early decelerations: present or absent Accelerations : present or absent Suspicious Pattern Baseline heart rate between 150 and 170 bpm or between 100 and 110 bpm Range of variability between 5 and 10 bpm for more than 10 bpm for more than 100 40 min Increase in variability above 25 bpm Variable decelerations Suspect (a CTG where one of the following characteristics is present and all others fall into the reassuring category) Baseline rate - 100-109 bpm - 161-180 bpm Baseline variability Deceleration - Typical variable decelerations with >50% of contractions occurring for >90 min - Single prolonged deceleration for up to 3 min Accelerations - The absence of accelerations with a normal trait otherwise is of uncertain significance Category II (Traces category II FHR includeall Non-Categorized FHR strokes as Category I or Category III. Examples of category II FHR tracings include any of the following) Baseline rate - Bradycardia not accompanied by missing baseline variability - Shortline variability - Minimal variability - Absent variability without recurrent deceleration - Marked variability - Marked variability accelerations - Absence of induced accelerations after periodic fetal stimulation or episodic decelerations - Recurrent variable decelerations accompanied by minimum or moderate baseline variability - Prolonged deceleration 2-10 min - Recurrent late decelerations with moderate baseline variability - Variable decelerations with other characteristics, as slow return to baseline, overcoming or shoulders Pathological pattern Baseline heart rate <100 or=>170 bpm Persistence of heart rate variability of <5 bpm= for=>40 min Severe variable decelerations or severe repetitive decelerations prolonged decelerations Late decelerations : the most sinister trait is a constant baseline with no baseline variation capacity and with small decelerations after each contraction A pathological sinusoidal pattern (a CTG with one or more of the following characteristics or two or more characteristics in the previous category) Line rate base - <100 bpm= –=>180 bpm - Sinusoidal pattern ≥ baseline variability of 10 min Decelerations - Atypical variable decelerations with contractions of >50% to >30 min - Decelerations late for >30 min - Prolonged deceleration >3 min Category III (category III FHR strokes include any) FHR variability without baseline and any of the following: -</100> </5> </100> </100> Late decelerations - Recurrent variable decelerations - Sinusoidal Bradycardia Pattern Adapted from Ayres-de-Campos D, Bernardes J. Twenty-five years after the FIGO guidelines for the use of fetal monitoring: time for a simplified approach? Int J Gynaecol Obstet. 2010;110:1-6. FIGO, International Federation of Gynecology and Obstetrics; ACOG, the American College of Obstetricians and Gynecologists, NICE, National Institute for Health and Care Excellence; FHR, fetal heart rate; bpm, beats per minute. The cases were selected from a pre-existing database of intrapartum TCGs acquired in a tertiary university hospital 11. All patients gave their written consent to use their screenings anonymously for research purposes. Working women were consecutively selected if they met the following inclusion criteria: singleton pregnancy, ≥37 weeks of gestation, fetus in cephalic presentation, absence of known fetal malformations, active phase of labor and indication established for continuous monitoring of CTG (increased or induced labor, staining of amniotic fluid meniconium, abnormalities detected in admission CTG or intermittent fetal auscultation). All patients were continuously monitored until delivery using a fetal electrode and an external tocoinameter. Paired umbilical cord blood sampling and analysis were performed in all cases, and fetal acidemia was defined as a pH value of the umbilical artery of ≤7.05. The cases were later excluded if one of the following situations was documented: total crawl length <60 min, loss of signal in the last hour of screening greater than 15%, interval between tracing-end and vaginal delivery greater than 5 min, or interval between screening-end and cesarean delivery greater than 20 minutes, complications with potential to influence fetal oxygenation recorded between tracing-end and delivery (shoulder dystocia, difficult cesarean extraction, etc.), anesthetic complications at the time of delivery, or invalid values of cord gas 11. A total of 193 patients were enrolled and 42 subsequently excluded, leaving 151 cases for analysis in the study. Only the last 60 minutes of screening of patients obtained before delivery were presented to physicians. No additional clinical information was provided, except that the records were acquired shortly before birth in singleton term pregnancies. Ctg tracings were presented at a paper speed of 1 cm/min to the group of physicians using the FIGO and NICE guidelines and at a paper speed of 3 cm/min to the group of physicians using the ACOG guidelines. A total of 27 clinicians performed ctg analysis, nine of each of the three different centers where the referred guidelines were routinely used. The fig guidelines group was from Santa Maria Hospital in Lisbon, Portugal, the ACOG guidance group was recruited from Beth Israel Deaconess Medical Center in Boston, USA, and the NICE guidance group was recruited from St. George's Hospital, University of Reino unido. Em cada centro, três dos médicos selecionados tinham > 10 anos de experiência em análise de CTG, três tinham de 6 a 10 anos de experiência e três tinham <6 years= of= experience.= each= clinician= only= evaluated= the= 151= tracings= once= and= according= to= the= guidelines= he/she= was= accustomed= to.= clinicians= received= digital= copies= of= the= tracings= by= email= in= word= format,= together= with= a= file= summarizing= the= main= points= of= the= guidelines= to= be= used.= they= were= asked= to= view= the= tracings= independently= and= to= evaluate= fhr= baseline,= variability,= accelerations= and= decelerations,= before= attributing= an= overall= tracing= classification.= interobserver= agreement= was= assessed= using= the= proportions= of= agreement= (pa)= and= the= proportion= of= specific= agreement= (pa= for= each= category) ,= as= recommended= by= the= guidelines= for= reporting= reliability= and= agreement= studies= (grras)= 12.= for= all= results,= 95%= ci= were= calculated,= and= findings= were= considered= significantly= different= if= these= intervals= did= not= overlap.= if= the= lower= limit= of= the= 95%= ci= for= pa= was=></6> <0.50, agreement= was= also= considered= to= be= poor= 13.= reliability= was= evaluated= with= the= κ= statistic= (κ-light's= κ= for= n= raters),= which= adjusts= pa= to= the= agreement= expected= by= chance,= so= the= distribution= of= ratings= in= the= different= classes= influences= the= results.= it= is= possible= to= obtain= a= high= pa= and= a= low= κ= when= the= prevalence= of= a= given= rating= is= very= high= or= low= 14.= values= of= κ=></0.50 ,> <0.20 were= considered= as= slight= reliability;= those= ranging= between= 0.21= and= 0.40= as= fair= reliability,= those= between= 0.41= and= 0.60= as= moderate= reliability,= those= between= 0.61= and= 0.80= as= substantial= reliability,= and= values=>0,80 como confiabilidade quase perfeita 15. Os rastreamentos classificados como patológico/categoria III foram comparados com todos os demais em relação à sua capacidade de prever acidemia recém-nascida. Sensibilidade e especificidade foram calculadas com IC 95%. A análise estatística foi realizada utilizando o pacote R obs.agree versão 1.0 (Free Software Foundation, Boston, MA, USA). Aprovação do Hospital S. João, Comitê de Ética em Pesquisa da Escola de Medicina do Porto foi obtido para o estudo (Comissão de Ética do Centro Hospitalar de São João, Parecer nº 28/2010, 19/07/2010). Os procedimentos estavam de acordo com os padrões éticos do comitê e com a Declaração de Helsinque. Todos os rastreamentos foram analisados pelos 27 clínicos, totalizando 4.077 avaliações. A Tabela 3 apresenta a avaliação das características básicas do CTG e a classificação geral de rastreamento por médicos em cada grupo de estudo. Em todos os grupos, a maioria dos rastreamentos foi avaliada como tendo linha de base normal e variabilidade normal. Os médicos dos grupos FIGO e considered that the majority of the screenings showed accelerations, while those of the NICE group considered otherwise. All groups identified slowdowns in most screenings. The ACOG group classified 81% of the screenings as category II, while the suspect classification was selected only by 52% in the FIGO group and 33% in the NICE group. Table three. Distribution</0.20> Distribution</0.20> the different evaluations of the characteristics of basic cardiotocography (CTG) and general classification of screening by the three groups of clinicians, using the FIGO, The ACOG and NICE guidelines, respectively, CTG present FIGO 1987 ACOG 2010 NICE 2007 n % n % n % Baseline Normal 848 62 1120 82 1079 79 Tacchia 443 33 195 14 251 19 Bradycardia 68 5 44 3 29 2 Normal Variability 1066 78 1127 83 115 7 85 Abnormal 293 22 232 17 202 15 Current Accelerations 816 60 805 59 529 39 Absent 543 40 554 41 830 61 Slowdowns Present 1228 90 1205 89 1207 89 Absent 131 10 154 11 152 11 General tracking classification Cat. I/Normal 116 9 171 13 401 30 Cat. II/Suspect 712 52 1106 81 452 33 Cat. III/Pathological 531 39 82 6 506 37 n = number of classifications, % = percentage of tracings where these classifications were assigned. The total number of CTG assessments for each study group was 1359 (151 × 9 clinical). ACOG, the American College of Obstetricians and Gynecologists; FIGO, International Federation of Gynecology and Obstetrics; NICE, National Institute of Excellence in Health and Care. The interobserver agreement and reliability in the evaluation of the basic features of the CTG and the general classification of screening are shown in Table 4. For the FHR baseline, agreement and reliability were high and similar in all groups. The highest agreement was reached in the identification of a normal Baseline of the FHR, and the results were significantly better in the ACOG and NICE groups than in the FIGO group. Bradycardia presented the smallest agreement, and no difference between the groups was identified. Table four. Interobserver agreement evaluated by the proportions of agreement (PA), and reliability evaluated by the kappa statistics (κ) with respective 95% CI, for the evaluation of basic cardiotocography (CTG) features and overall tracing classification by the three study groups of clinicians FIGO 1987 ACOG 2010 NICE 2007 PA (95% CI) κ (95% CI) PA (95% CI) κ (95% CI) PA (95% CI) κ (95% CI) FHR baseline 0.81 (0.78–0.85) 0.63 (0.57–0.70) 0.88 (0.84–0.91) 0.59 (0.49–0.69) 0.88 (0.85–0.91) 0.65 (0.58–0.72) Normal 0.86 (0.83–0.89) 0.93 (0.90–0.95) 0.93 (0.91–0.96) Tachycardia 0.80 (0.73–0.85) 0.67 (0.57–0.77) 0.73 (0.66–0.80) Bradycardia 0.40 (0.25–0.54) 0.49 (0.07–0.71) 0.42 (0.00–1.00) Variability 0.83 (0.80–0.86) 0.51 (0.42–0.61) 0.85 (0.82–0.88) 0.49 (0.39–0.59) 0.83 (0.80–0.86) 0.38 (0.29–0.50) Normal 0.89 (0.87–0.92) 0.91 (0.89–0.93) 0.90 (0.88–0.92) Abnormal 0.61 (0.51–0.69) 0.57 (0.45–0.66) 0.44 (0.32–0.53) Accelerations 0.67 (0.64–0.71) 0.34 (0.29–0.41) 0.67 (0.63–0.70) 0.34 (0.28–0.40) 0.71 (0.68–0.75) 0.41 (0.35–0.48) Yes 0.73 (0.68–0.77) 0.72 (0.72 (0.78 67–0.76) 0.61 (0.57-0.68) No 0.59 (0.54–0.64) 0.59 (0.53–0.64) 0.76 (0.72–0.80) Decelerations 0.92 (0.8 9–0.95) 0.53 (0.43-0.66) 0.85 (0.82–0.88) 0.28 (0.18–0.46) 0.89 (0.85–0.91) 0.47 (0.35–0.59) Yes 0.96 (0.94–0.97) 0.92 (0.89–0.93) 0.94 (0.92–0.95) No 0.59 (0.48–0.69) 0.35 (0.23–0.45) 0.49 Classification 0.64 (0.61–0.67) 0.37 (0.31–0.43) 0.73 (0.70–0.76) 0.15 0.15 0.55 (0.51-0.58) 0.33 (0.28-0.39) Cat. I/Normal 0.54 (0.39-0.64) 0.26 (0.18-0.33) 0.55 (0.48-0.62) Cat. II/Suspect 0.67 (0.62-0.70) 0.83 (0.81-0.86) 0.42 (0.38-0.47) Cat. III/Pathological 0.63 (0.57-0.68) 0.26 (0.18-0.34) 0.66 (0.59-0.71) FHR, fetal heart rate; FIGO, International Federation of Gynecology and Obstetrics; ACOG, the American College of Obstetricians and Gynecologists, NICE, National Institute for Health and Care Excellence. High agreement was found in the evaluation of variability, with no significant differences between the groups. All groups showed greater agreement in the identification of normal variability. To identify accelerations, a similar agreement was found between all groups, with the NICE group showing a significantly greater agreement on the identification of no accelerations. The FIGO group presented greater agreement than the ACOG in the identification of decelerations (present and absent), and all groups showed lower agreement in the identification of absent decelerations. In the overall screening classification, the ACOG group had a significantly higher agreement than fig, and both had a significantly higher agreement than NICE. In the ACOG group, the category II classification reached a significantly higher agreement than any other guideline classification, but category I and category III achieved a significantly lower agreement than others. Significantly lower reliability was obtained with the ACOG classification than with FIGor or NICE. The κ values in the overall tracking classification represent a slight/fair reliability with all guidelines. Table 5 presents interobserver agreement according to the number of years of experience in the analysis of the CTG. Physicians with <6 years= of= experience= in= the= acog= group= showed= the= highest= agreement= in= tracing= classification,= but= this= was= mainly= due= to= agreement= on= category= ii.= in= the= fig= and= nice= groups = there= were= no= significant= differences= in= agreement,= according= according= the= level= of= experience.= table= 5.= interobserver= agreement= evaluated= by= the= proportions= of= agreement= (pa)= with= respective= 95%= confidence= intervals= (95%= ci),= for= tracing= classification= by= clinicians= of= the= three= study= groups,= according= to= their= previous= experience= in= cardiotocography= interpretation= pa= (95%= ci)= fig= 1987= aco g= 2010= nice= 2007=>10 years of experience Total 0.61 (0.56-0.67) 0.58 (0.53-0.63) 0.54 (0.48-0.59) Cat. I/Normal 0.52 (0.31-0.68) 0.31 (0.20-0.40) 0.60 (0.52-0.68) Cat. II/Suspect 0.67 (0.60-0.72) 0.70 (0.65-0.74) 0.33 (0.25-0.41) Cat. III/Pathological 0.56 (0.47-0.64) 0.32 (0.13-0.48) 0.66 (0.57-0.74) 6-0 Experience of 10 years Total 0.62 (0.58-0.68) 0.73 (0.68-0.79) 0.54 (0.49-0.60) Cat. I/Normal 0.57 (0.38-0.71) 0.11 (0.03-0.19) 0.48 (0.33-0.60) Cat. II/Suspect 0.65 (0.59-0.71) 0.84 (0.80-0.88) (0,36-0,52) Gato. III/Patológico 0,60 (0,51-0,68) 0,12 (0,00-0,21) 0,65 (0,58-0,72) <6 years experience Overall 0.63 (0.58–0.69) 0.88 (0.85–0.92) 0.55 (0.49–0.60) Cat. I/Normal 0.52 (0.29–0.69) years= experience= overall= 0.63= (0.58–0.69)= 0.88= (0.85–0.92)= 0.55= (0.49–0.60)= cat.= i/normal= 0.52= (0.29–0.69)=></6 years experience Overall 0.63 (0.58–0.69) 0.88 (0.85–0.92) 0.55 (0.49–0.60) Cat. I/Normal 0.52 (0.29–0.69) > </6> </6> (0.25-0.64) 0.58 (0.48-0.68) Gato. II/Suspeito 0,63 (0,57-0,70) 0,94 (0,91-0,96) 0,39 (0,32-0,46) Gato. III/Patológico 0,65 (0,58-0,73) 0,25 (0,00-0,53) 0,67 (0,57-0,74) FIGO, Federação Internacional de Ginecologia e Obstetrícia; ACOG, o American College of Obstetricians and Gynecologists, NICE, National Institute for Health and Care Excellence. Nos 151 casos avaliados havia sete recém-nascidos com pH de sangue arterial umbilical ≤7,05, mas nenhum caso de encefalopatia hipoxica-isquêmica. A sensibilidade e especificidade dos traçados da categoria III/patológica na previsão da acidemia é exibida na Tabela 6. Os grupos FIGO e NICE apresentaram tendência para uma sensibilidade maior do que a ACOG, mas as diferenças não foram estatisticamente significativas. Por outro lado, o grupo ACOG apresentou uma especificidade significativamente maior do que as demais. Não foram encontradas diferenças significativas nessas comparações entre os níveis de perícia. Mesa 6. Sensibilidade e especificidade de todos os rastreamentos classificados pelos observadores como patológico ou categoria III na previsão da acidemia recém-nascida, por grupo de estudo, e de acordo com o número de anos de experiência dos médicos na análise cardiotocografia Sensibilidade % (IC95%) Especificidade % (95% IC) FIGO 1987 89 (52-98) 63 (55–71) >10 anos de experiência 90 (59-100) 67 (59-74) 6-10 anos de experiência 86 (42-100) 64 (5 6-72) <6 years= experience= 90= (59–100)= 58= (50–66)= acog= 2010= 32= (10–67)= 95= (90–98)=>10 anos de experiência 38 (10-71) 92 (87-96) 6-10 anos de experiência 24 (4-58) 95 (91-98) <6 years= experience= 33= (18–81)= 98= (94–99)= nice= 2007= 97= (61–100)= 66= (58–73)=>10 anos de experiência 95 (56-100) 72 (64-79) 6-10 anos de experiência 95 (59-100) 57 (49-65) <6 years experience 100 (59–100) 67 (59–75) FIGO, International Federation of Gynecology and Obstetrics; ACOG, the American College of Obstetricians and Gynecologists; NICE, National Institute for Health and Care Excellence. This study compares the agreement, reliability and accuracy of FIGO, ACOG and NICE guidelines for CTG interpretation and showed that attribution of category II is very frequent with the ACOG guidelines, leading to a high overall interobserver agreement, a low reliability, a low sensitivity and a high specificity of category III tracings in the prediction of fetal acidemia. With the FIGO and NICE guidelines, a more balanced distribution of classifications is seen, and there appears to be a higher sensitivity and a lower specificity of pathological tracings in prediction of fetal acidemia. This study also confirms that there is strong agreement in identification of normal baseline, tachycardia, normal variability, and presence of accelerations and decelerations. It was not possible to evaluate the classification of decelerations, as these events are defined differently in the three guidelines. Other studies evaluating the reproducibility of CTG analysis using the and ACOG guidelines have shown that there is a fair to good agreement in evaluation of the baseline and years= experience= 100= (59–100)= 67= (59–75)= figo,= international= federation= of= gynecology= and= obstetrics;= acog,= the= american= college= of= obstetricians= and= gynecologists;= nice,= national= institute= for= health= and= care= excellence.= this= study= compares= the= agreement,= reliability= and= accuracy= of= figo,= acog= and= nice= guidelines= for= ctg= interpretation= and= showed= that= attribution= of= category= ii= is= very= frequent= with= the= acog= guidelines,= leading= to= a= high= overall= interobserver= agreement,= a= low= reliability,= a= low= sensitivity= and= a= high= specificity= of= category= iii= tracings= in= the= prediction= of= fetal= acidemia.= with= the= figo= and= nice= guidelines,= a= more= balanced= distribution= of= classifications= is= seen ,= and= there= appears= to= be= a= higher= sensitivity= and= a= lower= specificity= of= pathological= tracings= in= prediction= of= fetal= acidemia.= this= study= also= confirms= that= there= is= strong= agreement= in= identification= of= normal= baseline,= tachycardia,= normal= variability,= and= presence= of= accelerations= and= decelerations.= it= was= not= possible= to= evaluate= the= classification= of= decelerations,= as= these= events= are= defined= differently= in= the= three= guidelines.= other= studies= evaluating= the= reproducibility= of= ctg= analysis= using= the= figo= and= acog= guidelines= have= shown= that= there= is= a= fair= to= good= agreement= in= evaluation= of= the= baseline= and=></6 years experience 100 (59–100) 67 (59–75) FIGO, International Federation of Gynecology and Obstetrics; ACOG, the American College of Obstetricians and Gynecologists; NICE, National Institute for Health and Care Excellence. This study compares the agreement, reliability and accuracy of FIGO, ACOG and NICE guidelines for CTG interpretation and showed that attribution of category II is very frequent with the ACOG guidelines, leading to a high overall interobserver agreement, a low reliability, a low sensitivity and a high specificity of category III tracings in the prediction of fetal acidemia. With the FIGO and NICE guidelines, a more balanced distribution of classifications is seen, and there appears to be a higher sensitivity and a lower specificity of pathological tracings in prediction of fetal acidemia. This study also confirms that there is strong agreement in identification of normal baseline, tachycardia, normal variability, and presence of accelerations and decelerations. It was not possible to evaluate the classification of decelerations, as these events are defined differently in the three guidelines. Other studies evaluating the reproducibility of CTG analysis using the FIGO and ACOG guidelines have shown that there is a fair to good agreement in evaluation of the baseline and > </6> </6> </6> and a bad deal in relation to decelerations 3, 16. It has also been reported that the ctg classification as category I/normal is more reproducible than the other categories 4, 5, 17-19. Our study demonstrates that this depends on the selected guidelines. With the ACOG guidelines, the classification in category I was less reproducible, while with the other guidelines the differences were generally small and not statistically significant. Three-layer classification systems generally suggest no action for category I/normal tracings and rapid intervention for category III/pathological tracings. Thus, these two categories are probably the most directly associated with outcomes and intervention rates. A low percentage of screenings considered normal may be associated with a higher rate of obstetric intervention, while a low percentage of screenings considered pathological may be associated with poor neonatal outcomes. Category II/suspicion includes a broad spectrum of heterogeneous RDA patterns that are inconsistently associated with fetal acidemia, making clinical management of these situations more uncertain. Several studies have shown that CTG has high sensitivity and limited specificity in predicting fetal hypoxia/acidosis. Our study demonstrates that this finding depends on the interpretation guidelines used. ACOG guidelines tend to classify abnormal patterns more in category II, due to more restrictive criteria for category III, and some cases of acidemia were classified in category II, hence the tendency of lower sensitivity and greater specificity of these guidelines. With the FIGO and NICE guidelines, the cases of acidemia were more in the pathological category, thus increasing the sensitivity for the detection of acidemia, but decreasing specificity. These results, however, need to be interpreted with caution, given the low number of cases with newborn acidemia. The interobserver agreement and accuracy were not strongly affected by the years of practice of physicians for the FIGO and NICE groups, suggesting that they can be generalized to all physicians with at least 6 years of experience. Similar findings have also been reported by others 16, 19-22. On the other hand, physicians with fewer years of experience can follow the guidelines more rigorously and this may be responsible for the slightly better agreement obtained in the ACO