Author’s response to reviews

Title: Sawtooth fetal heart rate pattern associated with a favorable neurological outcome in an infant: a case report

Authors:

Satoshi Ohira (osatoshi@shinshu-u.ac.jp)
Sakura Yamanaka (sakurako6292@gmail.com)
Ryoichi Asaka (rasaka@shinshu-u.ac.jp)
Hirofumi Ando (hando@shinshu-u.ac.jp)
Chiho Fuseya (chihofuseya@shinshu-u.ac.jp)
Norihiko Kikuchi (kknori@sjinshu-u.ac.jp)
Tsutomu Miyamoto (tmiya@shinshu-u.ac.jp)
Makoto Kanai (makotok@shinshu-u.ac.jp)
Tanri Shiozawa (tanri@shinshu-u.ac.jp)

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Author’s response to reviews:

List of the changes in the revised manuscript

Title: “Sawtooth fetal heart rate pattern associated with a favorable neurological outcome in an infant: a case report” (Manuscript ID: JMCR-D-18-00847)

Our response to Reviewers’ comments
Reviewer reports:

Reviewer #1:

Comments:

- Authors need to clearly recap the data from reference [8] to compare and validate

According to the Reviewer’s advice, we added the following sentence in the discussion, “The FHR pattern in our case demonstrated 3-4 oscillations per minute, amplitude of 30-40 bpm, and indeterminate baseline. Therefore, the FHR pattern in our case is consistent with the above-described features of the sawtooth FHR pattern.” (page 4, line 10-13, in the revised manuscript)

Moreover, we added words of “with indeterminate baseline” and “sharp oscillations” in the case presentation and the figure legends. (page 3, line 20 and page 7, line 11-12, in the revised manuscript)

- Another such record (having sawtooth FHR) may strengthen the theory

Because the past report of sawtooth FHR pattern is only Andrikopoulou’s [8] article, we can not review another article of sawtooth pattern. But we added the discussions about pseudo-sinusoidal FHR patterns which resemble sawtooth pattern as below,

“Other than true sinusoidal FHR pattern, another conventional undulating FHR pattern may be due to pseudo-sinusoidal FHR pattern [10, 12]. Pseudo-sinusoidal FHR patterns include all patterns in which undulatory waveforms, or regular FHR baseline oscillations of constant amplitude, alternative with episodes of normal baseline variability or activity [12]. Murphy et al. observed 230 pseudo-sinusoidal FHR patterns in labor, and classified 219 into minor (amplitude 5-15 bpm), and 11 into intermediate (amplitude 16-24 bpm). Major pseudo-sinusoidal patterns (amplitude >24 bpm) were not observed [12]. If before sawtooth FHR pattern was proposed, our case might be considered to be a major pseudo-sinusoidal pattern because of large amplitude.” (page 4, line 14-22, in the revised manuscript)

Moreover, we added a new reference [13] as below,

- Can we call saw tooth pattern 30-40 variations as variations rather then 30-40 bpm?
We can call such amplitude as sawtooth pattern.

Is the interpretation (discussion and conclusion) well balanced and supported by the case presented?
Comments: A little incomplete. Authors need to elaborate more.
According to the Reviewer’s advice, we enhanced the discussion as above.

Does the case represent a useful contribution to the medical literature?
Comments: yes. Another similar saw tooth FHR pattern would strength the case further.
Because the past report of sawtooth FHR pattern is only Andrikopoulou’s [8] article, we cannot review another article of sawtooth pattern. But we added the discussions about pseudo-sinusoidal FHR patterns which resemble sawtooth pattern as above.

Reviewer #2:

A summary of the clinical course of all follow-up visits
Comments: No there is important data missing about the long term followup for this baby
We enhanced the course of the infant as below,

“Sarnat staging for hypoxic-ischemic encephalopathy [9] of this newborn was grade II moderate. Therefore, the infant received brain cooling for 72 hours from four hours after birth. No abnormal findings were detected by brain magnetic resonance imaging performed on 13 days after birth, and the infant was discharged uneventfully. A follow-up examination including DENVER II Developmental Screening Test [10] at age 1, 2, and 3 years demonstrated no developmental restriction respectively.” (page 3, line 30- page 4, line 1, in the revised manuscript)
We added two references in the revised manuscript.


Is the interpretation (discussion and conclusion) well balanced and supported by the case presented?

Comments: No Given the fact that the previous information about the sawtooth pattern was ignored and there is no acidbase status for the neonate given this paper is seriously flawed

Because the past report of sawtooth FHR pattern is only Andrikopoulou’s [8] article, we described their definition of sawtooth FHR pattern as below,

“The sawtooth FHR pattern is rare, and is sometimes confused with sinusoidal pattern [8]. This FHR pattern is characterized by the following: (1) Three to five sawtooth-like sharp oscillations per minute; (2) amplitude > 20 bpm; and (3) unstable or indeterminate baseline [8].”

We added acid base information about newborn, “The umbilical artery cord pH was not available because the artery collapsed. The newborn was not severely anemic, with a hemoglobin level of 13.3 g/dl. The venous blood pH was 6.860 and base excess was -21.9.” (page 3, line 27-30, in the revised manuscript)

9. Additional comments for the author(s)?

This paper describes the saw tooth pattern as being rare. In fact it is often found for periods of time in labour, with the periods being self limiting. The case presented here is one of fetal hypoxia with the neonate requiring cooling. It is impossible to say that this baby is normal given the 66% association of neurological deficit that develops with HIE type 2 and 3 over a period of 2 years after birth. No one can yet say this baby was normal. The lack of acidbase status for the baby is puzzling given the baby went to the NICU. That data is essential for publication.
We added acid base and HIE information as below,

“The venous blood pH was 6.860 and base excess was -21.9. Sarnat staging for hypoxic-ischemic encephalopathy [9] of this newborn was grade II moderate. Therefore, the infant received brain cooling for 72 hours from four hours after birth. No abnormal findings were detected by brain magnetic resonance imaging performed on 13 days after birth, and the infant was discharged uneventfully.” (page 3, line 29-34, in the revised manuscript)

In 2004, Modanlou HD and Murata Y. published their article on the sinusoidal pattern (J Obstet Gynaecol Res. 2004 Jun;30(3):169-80. Sinusoidal heart rate pattern: Reappraisal of its definition and clinical significance. They pointed out that the pattern was of ominous significance requiring further assessment of fetal condition by ultrasound. The authors of the submitted article do not seem to have taken the advice.

Because the FHR tracing was undulating feature in our case, we observed biophysical profile by ultrasonography. “Although fetal movement was slightly observed, only a small amount of amniotic fluid was noted by ultrasonography.” (page 3, line 21-22, in the revised manuscript)

Therefore, given the severely compromised state of this baby and the lack of acidbase status and follow up data this paper is not acceptable or publication in my view

We added acid base information and follow up information as above.

The CTG trace has no time scale.

According to the Reviewer’s advice, we added time scale in Figure 1 and Figure 2. (in the revised figures)