

INTRODUCTION

- Fetuses at 16–39 weeks of gestation have been shown to respond to intravaginally emitted melodic sound with repetitive facial and speech movements, that can be evaluated by transabdominal ultrasound.
- However, whether different sound types (such as human voice, or music) can elicit different response patterns is still unclear.

OBJECTIVES

- We studied the effect of human voice of various qualities, emitted by an intravaginal device, on fetal facial response.

METHODS

- We conducted a single-operator prospective observational study assessing mouth and tongue movements of fetuses >18 weeks of gestation in response to various sound stimuli.
- Participants were randomly distributed into the study groups and stimulated with human voice (paternal, maternal or unrelated female voice), high-pitched voice (Mickey Mouse) or music (flute monody) using a commercially-available intravaginal sound emitter designed for this purpose.
- After a 5-minute baseline observation, duration of stimulation was of 5 minutes, without interruptions. Mouthing (MT: mouth opening or tongue movements inside the oral cavity) and tongue expulsion (TE: protrusion of the tongue over the lower lip) of the fetus were evaluated by 2D/3D/4D transabdominal ultrasound

RESULTS

- We enrolled 116 women ≥ 18 years of age and 18-34.4 weeks pregnant.
- No differences in the frequency of movements were detected at baseline between the study groups.
- The percentage of fetuses showing MT during stimulation was higher in all study groups compared to baseline ($p < 0.05$), and higher percentages were observed in groups stimulated with high-pitched voice or music.
- Similarly, significantly higher percentages of TE were observed in groups stimulated with high-pitched voice or music compared with human normal voice ($p < 0.0002$)

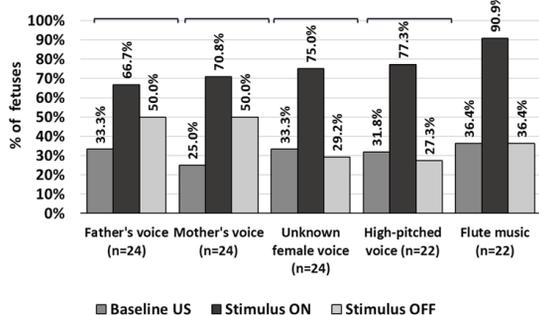


Mouthing (MT)

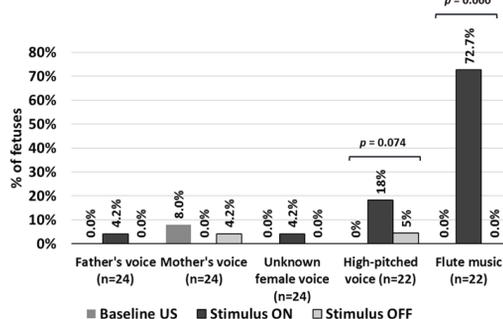


Tongue expulsion (TE)

A) Mouthing movements



B) Fetuses that protruded their tongue ≥ 1 time



CONCLUSIONS

- Intravaginal sound stimulation with sounds of different qualities elicited a direct response on fetal facial movements.
- The highest degree of stimulation was observed with high-pitched voice and music. Both share higher sound frequencies as compared with normal human voice, and these differential responses deserve future attention.