The Effects of Ultrasound with Acoustic Radiation Force Impulse on Biological Tissues

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The Japan Society of Ultrasonics in Medicine (JSUM) has been studying the *in vivo* biologic effects of ultrasound with **Acoustic Radiation Force Impulse (**ARFI), the main technique used for Shear Wave Elastography, through animal experiments.

Ultrasound with ARFI has a much longer pulse duration than conventional B-mode ultrasound and pulsed Doppler methods. Therefore, there are concerns about the effects of ultrasound *in vivo*, such as temperature increase, tissue effects, bleeding, and increased effects after the administration of contrast media.

As in animal experiments conducted by this committee, the effects on biological tissues were observed even below MI 1.9, which is the upper limit of acoustic output. These results were published in the Journal of Medical Ultrasonics (JMU), as listed in the following references.

The safety of ARFI for living organisms, especially for fetuses and the pregnant uterus, has not yet been confirmed by consensus. The Committee believes that fetuses and the pregnant uterus should not be exposed to ARFI because of safety concerns, even if it is presumed that the fetuses are not contained within the region of interest.

In the future, when such studies are submitted to JMU or to JSUM scientific meetings, it is suggested that safety and ethical considerations are thoroughly discussed before deciding to accept this technology.

References

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