QIBA Contrast Enhanced Ultrasound (CEUS) Biomarker Committee (BC) Call

Friday, April 12, 2019; 11 AM CT

Call Summary

In attendance			**RSNA**
Mike Averkiou, PhD (Co-Chair)	J. Brian Fowlkes, PhD	Nancy Obuchowski, PhD	Julie Lisiecki
Todd Erpelding, PhD, MSE (Co-Chair)	Christian Greis, PhD	Lihong Pan, PhD	Susan Stanfa
Paul Carson, PhD	Eric Juang		

Moderator: Dr. Averkiou

Recap of AIUM discussions (Dr. Erpelding):

- Approximately 10 QIBA CEUS BC members attended the QIBA in-person meeting at AIUM
- Results from the Bubble Conference, which describe the phantom experiment for the CEUS BC, were presented and included the following topics:
    - Phantom experiments
    - Bolus injection
    - Time-intensity curves (TICs)
    - Results from the variability study
    - Plans for defining amplitude-based parameters
- The QIBA proposals for pharma were also discussed in general terms

QIBA Proposals for Pharma (Dr. Averkiou):

- Dr. Averkiou briefly described his two proposals, which will be distributed for BC members to review and then submitted to US CC leadership and Dr. Zahlmann

1. **Perfusion quantification of liver lesions—a QIBA/CEUS pilot study**
    - *The primary goal of this project is to evaluate CEUS perfusion quantification in a clinical setting and establish its reproducibility.*
    - The project objectives are:
        1) Perform a pilot clinical study (15-20 patients) on patients with liver lesions in order to measure the QIBA perfusion quantification parameters
        2) Evaluate the variability of the QIBA perfusion parameters in 3 CEUS exams with every patient over 1 week
        3) Compare perfusion parameter variability between 2 different scanners

2. **Development of a standardized approach for CEUS perfusion quantification for the evaluation of tumor vascular density in multicenter trials**
    - *The primary goal of this project is to calibrate all scanners and commercial image analysis software to a reference intensity that corresponds to a reference concentration, in order to be able to compare perfusion quantification results between different scanners.*
    - The primary objectives are:
        1) to develop an in vitro setup that implements this calibration process
        2) to find the reference contrast agent concentration C0 that closely resembles the clinical dose arriving in the liver
        3) to calibrate all scanners so that the linearized value of the detected image intensity is I0
        4) to perform a variability study among systems

- It was noted that developing parameters that could be used more readily in drug trials would be appealing to pharma as US therapies are less expensive, non-ionizing, and faster than MR
- Dr. Erpelding mentioned that Canon would be happy to participate in the proposed studies as one of the representative manufacturers
- It was determined that despite similar clinical aims, a multi-modality comparison of contrast MR (gadolinium) vs. contrast US (microbubbles) would be difficult to compare

Action items:

- Dr. Averkiou to make slight modifications to his proposals to include more pharma-specific wording for RSNA staff to distribute to BC members and US CC leadership and Dr. Zahlmann prior to the April 15th deadline
    - Other suggested areas of focus included:
        - Clinical therapy monitoring
        - Cost effectiveness
        - Aid with new drug development

The next scheduled QIBA ultrasound calls will be as follows at 11 am CT:

- **4/26/2019** US Coordinating Committee, Quarter 2 call
- **5/3/2019** SWS BC call
- **5/10/2019** CEUS BC call

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