

スマートフォン型超音波装置による膀胱容量計測の検討

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抄 録

目的：スマートフォン型超音波装置が膀胱容量の計測に有用かを検討した。**対象と方法**：泌尿器領域の超音波検査依頼のうち、同意の得られた44症例を対象とした。1名の超音波検査士がスマートフォン型超音波装置にて膀胱の横径、上下径、前後径を計測した。次にその結果を受けずに他の超音波検査士が高性能超音波装置で同様に計測した。膀胱容量は(横径×上下径×前後径)×0.52の式にて算出した。**結果と考察**：スマートフォン型超音波装置と高性能超音波装置で計測した膀胱容量は相関係数 $R = 0.851$ で高い相関が得られた。しかし狭い視野角のため、膀胱全体が描出不能例では高性能超音波装置との間で計測値に乖離が見られた。**結論**：スマートフォン型超音波装置は膀胱容量計測において高性能超音波装置に準じた精度がある。在宅医療等での排尿ケア等、院外での医療現場で活用が期待される。

Investigation of bladder capacity measurement using a smartphone-type ultrasound device

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Abstract

Purpose: We aimed to investigate whether a smartphone-type ultrasound device could be used to satisfactorily evaluate bladder capacity. **Subjects and Methods**: Forty-four cases in which urological ultrasonography examination was requested were included in the study and patient consent was obtained. A smartphone-type ultrasound device was used by a sonographer to measure the transverse, vertical, and anteroposterior diameters of the bladder. Next, the same dimensions were measured using a high-performance ultrasound device that was operated by another sonographer who was blinded to the results obtained using the smartphone-type ultrasound device. The bladder capacity was calculated using the following formula: (transverse diameter × vertical diameter × anteroposterior diameter) × 0.52. **Results and Discussion**: The correlation coefficient of the bladder capacity measured by the smartphone-type ultrasound device and high-performance ultrasound device was high ($R = 0.851$). However, in cases in which the entire bladder could not be visualized owing to the small viewing angle, differences in measurement values between the high-performance ultrasound device and smartphone-type ultrasound device were observed. **Conclusion**: The smartphone-type ultrasound device has an accuracy equivalent to that of a high-performance ultrasound device in bladder capacity measurement. This can be utilized in medical practice outside hospitals, such as in home medical care for urination care.

Keywords

smartphone-type ultrasound device, bladder capacity

1. はじめに

携帯型超音波装置の検討報告は多々あるが¹⁾、スマートフォン型超音波装置(スマートフォン型装置)の検討報告はまだない。今回我々はパイロット試験として、スマートフォン型装置と高性能超音波

装置(高性能装置)を用いて同一患者の膀胱容量計測を行い、スマートフォン型装置を用いた膀胱容量の評価が可能かを検討した。

2. 対象と方法

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