

QIN GBM Treatment Response

Summary



This collection contains “double baseline” multi-parametric MRI images collected on patients with newly diagnosed glioblastoma. The patients were scanned after surgery but prior to the start of therapy, typically 2-5 days apart. The structural images included T1-weighted pre- and post-contrast images, T2-weighted images, FLAIR and MEMPRAGE images. Advanced MRI sequences included Diffusion Weighted (DW) Imaging, Dynamic Contrast-Enhanced MRI (DCE-MRI), and Dynamic Susceptibility Contrast MRI (DSC-MRI). The value of this collection is to provide clinical image data to establish the test-retest characteristics of parameters calculated from DW-MRI, DCE-MRI, and DSC-MRI such as ADC, Ktrans and rCBV. Data were provided by Dr. Elizabeth Gerstner and Dr. Kalpathy-Cramer (MGH) as part of their participation in the Quantitative Imaging Network. The images were obtained on 32-channel Siemens Trio 3T scanners using Siemens 32-channel head coils. T1-weighted imaging was performed using a 2D FLASH sequence with TR/TE/ = 600 ms/12 ms/90°, matrix size 256 × 216, field of view (FOV) 185mm × 220mm, 23 slices and 5mm slice thickness. T2-weighted imaging was performed using a 3D SPACE spin-echo sequence with TR/TE = 3200 ms/428 ms, matrix size 256 × 258, FOV 256mm × 256mm, 176 slices and 1mm slice thickness. FLAIR was performed using a 2D spin-echo inversion-recovery sequence with TR/TI/TE = 10000 ms/2500 ms/70 ms, matrix size 256 × 162, FOV 185mm × 220mm, 23 slices and 5mm slice thickness. MEMPRAGE was performed using a 3D multi-echo Magnetization Prepared Rapid Gradient Echo sequence with TR/TI/TE1/TE2/TE3/TE4/ =2530 ms/1200 ms/1.64 ms/3.5 ms/5.36 ms/7.22 ms/7°, matrix size 256 × 256, FOV 256mm × 256mm, 176 slices and 1mm slice thickness. A DW echo planar imaging sequence with trace diffusion sensitization and b-values of 0 and 700 s/mm², TR/TE = 7980 ms/84 ms, matrix size 128 × 128, FOV 237mm × 237mm, 64 slices and 1.86mm slice thickness, provided data for Apparent Diffusion Coefficient (ADC) maps. To estimate pre-contrast T1 relaxation time for DCE quantitation purposes, T1 mapping was performed by using a 3D FLASH sequence before the injection of contrast agent with TR/TE = 7.3 ms/4.41 ms, matrix size 128 × 128, FOV 230mm × 230mm, 20 slices, and 2.1mm slice thickness. This sequence was repeated five times at five different flip-angles of 2°, 5°, 10°, 15°, and 30°. DCE MRI utilized a 3D FLASH dual gradient-echo sequence with with TR/TE1/TE2/ = 6.8 ms/2.61 ms/3.89 ms/10°, matrix size 128 × 128, FOV 230mm × 230mm, 20 slices and 2.1mm slice thickness. The acquisition was repeated for 60 times (frames) for a total scan time of 6 min, corresponding to a temporal resolution of 6 s. A bolus of 0.1 mmol/kg of Gd-DTPA (gadopentetic acid) was injected 52 s after the scan started. Finally, a combined gradient-echo (ge) and spin-echo (se) 2D EPI sequence was performed to acquire DSC-MRI data with TR/TE(ge)/TE(se)/ = 1500 ms/31 ms/95 ms/80°, matrix size 160 × 160, FOV 192mm × 192mm, 12 slices and 5mm slice thickness. The acquisition was repeated 100 times for a total scan time of 2 min and 41 sec, corresponding to a temporal resolution of 1.61 s. A bolus of 0.1 mmol/kg of GD-DTPA was injected 80 s after the scan started.

About the NCI QIN

The mission of the QIN is to improve the role of quantitative imaging for clinical decision making in oncology by developing and validating data acquisition, analysis methods, and tools to tailor treatment for individual patients and predict or monitor the response to drug or radiation therapy. More information is available on the [Quantitative Imaging Network Collections](#) page. Interested investigators can apply to the QIN at: [Quantitative Imaging for Evaluation of Responses to Cancer Therapies \(U01\) PAR-11-150](#).

Data Access

This is a **limited access** data set. To request access, please contact help@cancerimagingarchive.net. Once access is granted, click the **Download** button to save a ".tcia" manifest file to your computer, which you must open with the [NIA Data Retriever](#). Click the **Search** button to open our Data Portal, where you can browse the data collection and/or download a subset of its contents.

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