

Survival of Glioblastoma Multiforme Patients Treated with Hypofractionated Radiotherapy with Integrated Boost Plus Temozolomide

Shimaa Abdallah GHARIEB¹, Yousra DORGHAM², Mohamed ABDELGAWAD³
& Shaimaa Farouk ABDELHAI⁴

¹ Assistant Lecturer of Clinical Oncology and Nuclear Medicine, Department of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Zagazig University, Zagazig University Hospitals, Zagazig, Egypt

² Professor of Clinical Oncology and Nuclear Medicine, Department of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Zagazig University, Zagazig University Hospitals, Zagazig, Egypt

³ Professor of Clinical Oncology, Department of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Zagazig University, Zagazig University Hospitals, Zagazig, Egypt

⁴ Lecturer of Nuclear Medicine, Department of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Zagazig University, Zagazig University Hospitals, Zagazig, Egypt

SUMMARY. Despite recent advances in multimodal treatments, the glioblastoma multiforme (GBM) prognosis remains poor. Hypofractionated radiotherapy regimens have been increasingly adopted for treatment of glioblastoma. To assess the survival rate when using hypofractionated radiotherapy with simultaneous integrated boost concurrently with temozolomide in treatment of GBM. The prospective study was conducted to forty-eight GBM patients referred to the Clinical Oncology & Nuclear Medicine Department, Zagazig University Hospitals, from August 2019 to August 2021. The patients were divided in two arms, Arm A include 24 patients treated prospectively by Hypofractionated radiotherapy with simultaneous integrated boost at a dose 50 Gy in 16 fractions, 3.12 Gy per fraction to high-risk planning target volume (PTV) and 40 Gy in 16 fractions, 2.5 Gy per fraction to low-risk PTV concurrently with TMZ and compared with Arm B that include 24 patients treated prospectively by conventional radiotherapy at a dose 60Gy / 30 fractions (phase I 46 Gy / 23 fractions and phase II 14 Gy / 7 fractions) concurrently with TMZ. Main outcome measures: Hypofractionated radiotherapy with integrated boost outcomes. For group A, 6 months OS (78.4%) and 12 months OS (43.6%), group B, 6 months OS (75%) and 12 months OS (52.5%). For group A the 6 months PFS rate was (59.2%) while 12 months PFS rate was (43.1%). For group B the 6 months PFS rate was (50.5%) while 12 months PFS rate was (39.8%) with no statistically significant difference between both groups. Hypofractionated radiotherapy shows promising comparable survival outcomes to conventional radiotherapy.

RESUMEN. A pesar de los avances recientes en los tratamientos multimodales, el pronóstico del glioblastoma multiforme (GBM) sigue siendo malo. Los regímenes de radioterapia hipofraccionada se han adoptado cada vez más para el tratamiento del glioblastoma. Evaluar la tasa de supervivencia cuando se usa radioterapia hipofraccionada con refuerzo integrado simultáneo junto con temozolomida en el tratamiento de GBM. El estudio prospectivo se realizó en cuarenta y ocho pacientes con GBM remitidos al Departamento de Oncología Clínica y Medicina Nuclear de los hospitales universitarios de Zagazig, desde agosto de 2019 hasta agosto de 2021. Los pacientes se dividieron en dos brazos, el brazo A incluye 24 pacientes tratados prospectivamente con radioterapia hipofraccionada con refuerzo integrado simultáneo a una dosis de 50 Gy en 16 fracciones, 3,12 Gy por fracción para volumen objetivo de planificación (PTV) de alto riesgo y 40 Gy en 16 fracciones, 2,5 Gy por fracción para PTV de bajo riesgo al mismo tiempo con TMZ y en comparación con el Grupo B que incluye 24 pacientes tratados prospectivamente con radioterapia convencional a una dosis de 60 Gy/30 fracciones (fase I 46 Gy/23 fracciones y fase II 14 Gy/7 fracciones) simultáneamente con TMZ. Principales medidas de resultado: radioterapia hipofraccionada con resultados de refuerzo integrados. Para el grupo A, OS 6 meses (78,4%) y OS 12 meses (43,6%), grupo B, OS 6 meses (75%) y OS 12 meses (52,5%). Para el grupo A, la tasa de SLP a los 6 meses fue (59,2 %), mientras que la tasa de SLP a los 12 meses fue (43,1 %). diferencia significativa entre ambos grupos. Conclusiones: la radioterapia hipofraccionada muestra resultados prometedores de supervivencia comparables a la radioterapia convencional.

KEY WORDS: glioblastoma, survival rate, radiotherapy, simultaneous boost, temozolomide.

* Author to whom correspondence should be addressed. E-mail: shimaagharieb222@gmail.com