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Prognostic factors associated with survival in patients with anaplastic oligodendroglioma.

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Abstract

Background

Anaplastic oligodendroglioma (AO) is a rare disease with inadequately understood prognosis. The aim of this study is to investigate factors associated with survival outcome in AO patients.

Methods

A population-based cohort study was conducted based on the Surveillance, Epidemiology, and End Results (SEER) program. Patients with histological diagnosis of AO from 1973 to 2015 were included.

Results

1899 AO patients were included in our study. Mean age of diagnosis was 49.2 years and 56.19% were male. 62.40% of patients were married and 87.05% were white. Most patients (90.42%) were diagnosed with AO as their first malignant primary tumor. 87.89% of patients had received cancer-directed surgery. Patients receiving surgery had a better prognosis for overall survival (OS) compared to those not receiving surgery after propensity score matching (PSM) analysis ($p<0.05$). The overall 1-, 3-, 5- and 10-year survival of AO was 78.7% ，60% ，50.2% and 36.2% respectively. Kaplan-Meier analysis indicated that age, marital status, first malignant primary indicator and surgery were associated with OS whereas sex and race were not. Moreover, an age value of 52 years was calculated as an optimal cutoff value to distinguish better and worse OS. Multivariate Cox proportional hazard analysis indicated that older age (OR 1.040, 95%CL 1.035-1.045), single patients (OR 1.293, 95%CL 1.103-1.515) and AO being not first malignant primary tumor (OR 1.501, 95%CL 1.238-1.820) were significantly associated with worse OS whereas surgery (OR 0.584, 95%CL 0.494-0.689) was associated with better OS. Moreover, a nomogram predicting 5- and 10-year survival probability for AO was constructed based on these variables.

Conclusion

Age, marital status, first malignant primary indicator and surgery were associated with survival of AO.

Prognostic factors associated with survival in patients with anaplastic oligodendrogliomaResults

1 This study was conducted based on the SEER program of the National Cancer Institute. The SEER program is the largest publicly available cancer registry, which prospectively collects cancer incidence, clinicopathological characteristics and survival data over approximately 30% of the American population from 1973.

2 We utilized the latest release data from the 2017 submission of SEER database (1973-2015) for analysis on October 15th, 2018. Patients with a diagnosis of AO were selected from the SEER database. The International Classification of Diseases for Oncology, Third Edition (ICD-O-3) histology codes were 9451.

3 Clinical variables including age, sex, race, marital status, first malignant primary indicator, surgery, months survived and vital status were collected. Patients with unknown records were excluded.

4 Marital status at diagnosis was divided into single, married and separated/divorced/widowed. Similarly, race was classified as white, black and others. First malignant primary indicator revealed whether AO was the first malignant primary tumor in patients or not. It was based on all the tumors in SEER database and tumors not reported to SEER were assumed malignant. The primary outcome was the disease-specific overall survival.

5 Data were summarized as mean±standard deviation (sd) for continued variables while percentage for categorical variables. Categorical variables among different groups of patients were compared by Chi-squared test. A PSM analysis was utilized to adjust the baseline confounding factors. The PSM model was based upon age, sex, race, marital status and first malignant primary indicator. OS was compared between the subgroups using Kaplan-Meier survival curves with log-rank test and univariate Cox proportional hazards analysis. Possible prognostic variables from univariate Cox proportional hazards analyses or Kaplan-Meier survival curves were admittedin a multivariate Cox proportional hazards analysis to assess which prognostic factors were independently associated with disease-specific OS. A nomogram was formulated based on the significant prognostic factors in multivariate Cox proportional hazards analysis to get a predicted survival probability at 5- and 10-years. Statistical analyses were performed by R software (3.5.0 version).