Progesterone-only Contraception is associated with a shorter progression-free survival in premenopausal women with WHO Grade I meningioma

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Background

The hypothesized hormonally driven relationship between sex steroids (estrogen and progesterone) and meningioma development and growth, tumor grade and recurrence has been well documented in the literature. The link between meningioma and sex steroids, initially established via histological presence of sex steroid receptors on meningioma tumor cells, has since been extrapolated to include the influence of exogenous hormone sources such as hormone replacement therapy and contraception. The vast majority of studies examining hormone-based contraceptives and meningioma risk have included oral preparations which are most often estrogen-only or estrogen/progesterone combination therapies, leaving out progesterone-only injectable and implantable options. Given the relative paucity of data on this subject, we sought to retrospectively compare the risk of meningioma recurrence in a series of premenopausal women taking progesterone-only contraception with those taking either estrogen-only or estrogen/progesterone combination therapy.

Methods

We performed a retrospective chart review of all female patients who underwent surgical resection for meningioma at the University of Colorado and Emory University between January 1990 and May 2013. Review of 1243 patients who met this criteria identified 67 premenopausal patients on hormonal contraception. The cohort was split into two groups based on type of contraception: (1) progesterone-only and (2) estrogen-progesterone combination or estrogen-only. Extent of resection was classified by Simpson Grade (1-5) as specified by the operative report. Length of follow-up was determined by the number of days between the date of surgical resection and the last follow-up appointment. Tumor recurrence was defined as radiographic evidence of new tumor growth or progression of residual and time to recurrence was defined as the interval between the date of surgical resection and the last follow-up appointment. Tumor recurrence was defined as radiographic evidence of new tumor growth or progression of residual and time to recurrence was defined as the interval between the date of surgical resection and the last follow-up appointment. Tumor recurrence was defined as radiographic evidence of new tumor growth or progression of residual and time to recurrence was defined as the interval between the date of surgical resection and the last follow-up appointment. Tumor recurrence was defined as radiographic evidence of new tumor growth or progression of residual and time to recurrence was defined as the interval between the date of surgical resection and the last follow-up appointment.

Results

We tabulated the demographic characteristics of our patient cohort and the differences in progression-free survival (PFS) between the two contraceptive subgroups. The Kaplan-Meier survival analysis demonstrated a statistically significant shorter time to progression-free survival (PFS) in women taking progesterone-only contraception as compared to those using estrogen-only or estrogen/progesterone combination therapy, despite a longer follow-up in the latter group. The two groups were well matched with respect to age, comorbid conditions, tumor location, degree of resection, adjuvant treatment and complications. Confounding factors well known to affect meningioma recurrence such as degree of resection were compared between the two groups and no significant difference was noted.

Discussion

In our series of 67 premenopausal women with WHO Grade I intracranial meningioma, recurrence was more frequent and occurred earlier (18 versus 32 months, p = 0.038) in patients using progesterone-only contraception as compared to those using estrogen-only or estrogen/progesterone combination therapy, despite a longer follow-up in the latter group. The two groups were well matched with respect to age, comorbid conditions, tumor location, degree of resection, adjuvant treatment and complications. Confounding factors well known to affect meningioma recurrence such as degree of resection were compared between the two groups and no significant difference was noted.

Conclusions and Future Work

Our study demonstrated progesterone-only contraception was associated with an increased risk of recurrence and a statistically significant shorter time to recurrence when compared to estrogen-only and estrogen/progesterone combination contraception. This study supports prior data suggesting that exogenous progesterone-only medications may represent a specific contraceptive subgroup that should be avoided in patients with meningioma. Properly powered randomized-controlled trials with correlative biology of the patient tumor tissue are needed to further investigate this association before more definitive treatment recommendations can be provided.

References