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Abstract

Background

Esophageal squamous cell carcinoma (ESCC) is one of the most lethal malignancies in Japan, with a 5-year survival rate of 20% to 30% after curative surgery. Even in the early disease stages, many patients develop local tumor recurrence or distant metastases within a short period after surgery.

Recently, nutritional aid therapies for esophageal cancer have taken on increased importance, since the nourishment state should be optimal when esophageal cancer patients receive medical attention. Above all, patients should be encouraged to take omega-3 PUFAs such as eicosapentaenoic acid (EPA) or docosahexaenoic acid (DHA). EPA plays a role in the inhibition of cell proliferation and as such the anti-cancer effect of EPA has been attracting attention in recent years.Eicosapentaenoic acid (EPA) suppresses the proliferation of cell lines derived from colon, pancreatic, breast, and other cancers. Few reports have described the effect of EPA on esophageal cancer cell lines.

Materials and Methods

We investigated the effect of EPA on the proliferation of the esophageal squamous cell carcinoma cell lines TE11 and KYSE180 with a WST-1 assay. Apoptosis was evaluated with a DNA fragmentation assay. Levels of apoptosis-related proteins (caspase-3, -7, -9 and PARP) and cleaved caspase-3, -7, -9 and PARP were evaluated by Western blot analysis.

Results

After exposure to EPA for 24 hours, KYSE180 and TE11 cell proliferation was suppressed in a dose-dependent manner ($p < 0.05$). In addition, caspase -3, -7,

-9 and PARP were activated. EPA (0.1 μM; 1 μM; 10 μM) induced apoptosis in a dose-dependent manner, as detected by DNA fragmentation assay.

Conclusions

EPA has potential as a new treatment for esophageal cancer.