Editorial

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Squamous cell carcinoma antigen in cervical cancer and beyond

Byoung-Gie Kim
Department of Obstetrics and Gynecology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea

See accompanying articles by Kawaguchi, Shimura and colleagues on pages 313 and 321.

Serum tumor markers can have several roles in many aspects of cancer management including early detection or diagnostic confirmation of cancers, predicting prognosis and/or response of specific treatment, and disease monitoring after primary treatment. Because the most of tumor markers have showed variable sensitivity and specificity in various conditions of specific cancers, there has been no ideal tumor marker in current clinical practice in oncology and squamous cell carcinoma antigen (SCC-Ag) in squamous cell carcinoma of cervix (SCC) is not exceptional. Since SCC-Ag, which can be produced through squamous formation of the uterine cervix and increased during the neoplastic transformation of the cervical squamous epithelium, was discovered in 1997 [1,2], many researches have been performed to investigate the role of serum SCC-Ag in SCC. However the clinical implementation of serum SCC-Ag is still controversial.

Serum SCC-Ag levels are elevated in 28%–88% of patients with SCC [3]. In early stage of SCC, higher levels of serum SCC-Ag is associated with the pathological risk factors for recurrence such as lymph node metastasis, deep stromal tumor invasion, lymph-vascular space invasion, and larger size of primary tumor in cervix. For example, the positive predictive value for lymph node metastases at >2, >4, and >8.6 ng/mL SCC-Ag is 51.4%, 70.0%, and 100% but the level of SCC-Ag itself was not an independent risk factor for recurrence [4]. On the contrary SCC-Ag level before treatment was reported to be independent risk factors for disease free survival and/or overall survival at multivariate analysis in other studies [5,6]. In a cohort study of 337 patients with IB1–IIA who were surgically treated, it was suggested that serum SCC-Ag level before surgery allows more refined preoperative estimation of the likelihood for adjuvant radiotherapy than pathological risk factors for recurrence representing clinical relevance of serum SCC-Ag in early stage SCC [7].

In locally advanced SCC, pre- and postradiotherapy serum SCC-Ag levels showed the prognostic significance. Hong et al. reported that pretreatment SCC-Ag levels higher than 10 ng/mL are an independent predictor for poor prognosis and persistently elevated SCC-Ag level at 2–3 months after radiotherapy had a significantly higher incidence of treatment failure in their large cohort [8]. In a Japanese study, the SCC-Ag level cut-off point for three-year overall survival rates, calculated using a receiver operating characteristic curve, was 1.15 ng/mL with the sensitivity of 80.0% and specificity of 74.0% [9]. In a retrospective study of 788 patients with SCC, clinical significance as a prognostic marker for progression free and/or overall survival was higher in locally advanced SCC than in early stage SCC [10].

Increasing serum SCC-Ag can precede the clinical diagnosis of relapse in 46%–92% of cases, with a median lead time ranging from 2 to 8 months [3]. However, there is still no strong evidence that the earlier intervention due to early detection of relapse is associated with better survival in recurrent SCC. In a previous study, serum SCC-Ag analysis results in earlier recurrence detection in a small proportion (14%) of patients but did not contribute to better survival [11]. On the other hand, another study reported that salvage treatment with radiotherapy or surgery resulted in improved survival compared with chemotherapy or palliative care in patients with serum SCC-Ag levels of less than <14.0 ng/mL at the time of recur-

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Correspondence to Byoung-Gie Kim
Department of Obstetrics and Gynecology, Samsung Medical Center, Sungkyunkwan University School of Medicine, 81 Irwon-ro, Gangnam-gu, Seoul 135-710, Korea. E-mail: bgkim@skku.edu

rence [12].

With the limitation of serum SCC-Ag as an ideal biomarker for SCC, other biomarkers such as CYFRA 21-1, immunosuppressive acidic protein, and vascular endothelial growth factor in patients' serum have been investigated but the results were modest or are still investigating [13]. And more recently there have been developments in the use of molecular imaging technology in oncological applications and the use of magnetic resonance imaging or positron emission tomography with or without combination of biomarkers in the management of cervical cancer [14].

In conclusion, serum SCC-Ag is a commonly used and may be the most promising biomarkers in patients with SCC until now. However, clinical relevance of serum SCC-Ag in SCC is still on debate and there should be more researches investigating the clinical application of SCC-Ag and developing new biomarkers in SCC in the future.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Kato H, Torigoe T. Radioimmunoassay for tumor antigen of human cervical squamous cell carcinoma. Cancer 1977;40:1621-8.
2. Maruo T, Yoshida S, Samoto T, Tateiwa Y, Peng X, Takeuchi S, et al. Factors regulating SCC antigen expression in squamous cell carcinoma of the uterine cervix. Tumour Biol 1998;19:494-504.
3. Gadducci A, Tana R, Fanucchi A, Genazzani AR. Biochemical prognostic factors and risk of relapses in patients with cervical cancer. Gynecol Oncol 2007;107:S23-6.
4. Bolger BS, Dabbas M, Lopes A, Monaghan JM. Prognostic value of preoperative squamous cell carcinoma antigen level in patients surgically treated for cervical carcinoma. Gynecol Oncol 1997;65:309-13.
5. Duk JM, Groenier KH, de Bruijn HW, Hollema H, ten Hoor KA, van der Zee AG, et al. Pretreatment serum squamous cell carcinoma antigen: a newly identified prognostic factor in early-stage cervical carcinoma. J Clin Oncol 1996;14:111-8.
6. Strauss HG, Laban C, Lautenschlager C, Buchmann J, Schneider I, Koelbl H. SCC antigen in the serum as an independent prognostic factor in operable squamous cell carcinoma of the cervix. Eur J Cancer 2002;38:1987-91.
7. Reesink-Peters N, van der Velden J, Ten Hoor KA, Boezen HM, de Vries EG, Schilthuis MS, et al. Preoperative serum squamous cell carcinoma antigen levels in clinical decision making for patients with early-stage cervical cancer. J Clin Oncol 2005;23:1455-62.
8. Hong JH, Tsai CS, Chang JT, Wang CC, Lai CH, Lee SP, et al. The prognostic significance of pre- and posttreatment SCC levels in patients with squamous cell carcinoma of the cervix treated by radiotherapy. Int J Radiat Oncol Biol Phys 1998;41:823-30.
9. Kawaguchi R, Furukawa N, Kobayashi H, Asakawa I. Posttreatment cut-off levels of squamous cell carcinoma antigen as a prognostic factor in patients with locally advanced cervical cancer treated with radiotherapy. J Gynecol Oncol 2013;24:313-20.
10. An JJ, Lee YY, Park JY, Choi CH, Kim TJ, Lee JW, et al. Prognostic value of pre-treatment SCC-Ag level in patients with cervical cancer. Korean J Obstet Gynecol 2011;54:428-34.
11. Esajas MD, Duk JM, de Bruijn HW, Aalders JG, Willemse PH, Sluiter W, et al. Clinical value of routine serum squamous cell carcinoma antigen in follow-up of patients with early-stage cervical cancer. J Clin Oncol 2001;19:3960-6.
12. Shimura K, Mabuchi S, Yokoi T, Sasano T, Sawada K, Hamasaki T, et al. Utility of serum squamous cell carcinoma antigen levels at the time of recurrent cervical cancer diagnosis in determining the optimal treatment choice. J Gynecol Oncol 2013;24:321-9.
13. Gadducci A, Tana R, Cosio S, Genazzani AR. The serum assay of tumour markers in the prognostic evaluation, treatment monitoring and follow-up of patients with cervical cancer: a review of the literature. Crit Rev Oncol Hematol 2008;66:10-20.
14. Lai CH, Yen TC, Ng KK. Molecular imaging in the management of cervical cancer. J Formos Med Assoc 2012;111:412-20.

 http://dx.doi.org/10.3802/jgo.2013.24.4.291