INTRODUCTION

It is estimated that there are 65,697 new cases of ovarian cancer and 41,448 deaths in Europe each year (1). Ovarian cancer is among the sixth leading cancers in Vojvodina and the fifth leading cause of cancer death among female population in Vojvodina according to Cancer Registry of Vojvodina in 2010. The majority of ovarian cancers cases are diagnosed at an advanced stage, FIGO stage III-IV with poor prognosis. The aim of the study was to evaluate newly diagnosed ovarian cancer among female population in Vojvodina (Serbia) and South Great Plain region in Hungary in 2007-2012 period.

PATIENTS AND METHODS

According to the census of population in Republic of Serbia in 2011, total number of population in region of Vojvodina is 1 916 889 (11). In South Great Plane in Hungary total number of population is 1 355 000 (12). In South Great Plane in Hungary total number of population is 1 355 000 (12). According to the first goal of the Cross-border biomarker research of ovarian cancer (HURSB/1203/214/091), co-financed by the European Union, we evaluated an epidemiological data of newly diagnosed ovarian cancer from Hospital Registry for Malignant Disease in Oncology Institute of Vojvodina and Department of Oncotherapy, University of Szeged in South Great Plain region in Hungary, in the period 2007-2012.

SUMMARY

Background: Ovarian cancer is among the sixth leading cancers in Vojvodina and the fifth leading cause of cancer death among female population in Vojvodina according to Cancer Registry of Vojvodina in 2010. The majority of ovarian cancers cases are diagnosed at an advanced stage, FIGO stage III-IV with poor prognosis. The aim of the study was to evaluate newly diagnosed ovarian cancer among female population in Vojvodina (Serbia) and South Great Plain region in Hungary in 2007-2012 period.

Methods: The evaluation was based on the data from hospital registries for malignant diseases at the Oncology Institute of Vojvodina and the Department of Oncotherapy, University of Szeged.

Results: The majority of patients were diagnosed in advanced disease (FIGO stage III-IV) in both regions. Serous epithelial ovarian cancer was the most common cancer type among studied women in both regions. The average age of women diagnosed with ovarian cancer was 60 years; there was no significant statistical difference related to patients age in both studied regions. Advanced stage of ovarian cancer investigated in our study showed a moderate descending liner trend with no significant statistical difference. The results from our study were similar when compared with the epidemiological data from the literature.

Conclusion: The lack of efficient screening methods is the major obstacle to improve the prognosis of women affected by this disease. Further investigations and introduction of new technologies applied to medical discoveries offers new hope for finding effective screening policies.

Key words: Ovarian Neoplasm; Epidemiology; Neoplasm Staging; Serbia; Hungary
evaluated for further therapy and patients that are treated at the Department of Oncotherapy, University of Szeged as center of gynecological oncology for South Great Plane region. For statistical evaluation, we used t-test. Values of p<0.05 were considered to denote significant differences.

RESULTS
From January 1, 2007 to December 31, 2012, 712 newly diagnosed ovarian cancer patients were registered at the Oncology Institute of Vojvodina (average: 118 patients per year) and 175 patients in SGP region, Hungary (average: 29 patients per year) (Figure 1).

The most common histopathological type was epithelial ovarian cancer: 74.44% (530/712) patients in Vojvodina and 89.71% (157/175) in SGP (p>0.05). The non-epithelial ovarian cancer was found in 6.74%, (48/712), patients in Vojvodina and 3.43%, (6/175) in SGP (p≤0.05). Patients with ovarian cancer of unknown histopathology were more common in Vojvodina compared to SGP: 18.82% (134/712) vs. 6.86% (12/175) (p≤0.05). In both regions, the most frequent was serous subtype of epithelial ovarian cancer: 299/530 patients in Vojvodina (average: 49.83 pt /year) and 126/157 (average: 21 pt/year) in SGP (p≤0.05). Endometrioid and mucinous subtypes were more common among women in Vojvodina than in SGP but difference was not significant (p>0.05) (Figure 2).

Ovarian cancer is classified according to FIGO classification. Due to suboptimal surgical staging in some hospitals in Vojvodina the FIGO stage was not determined in 113/712 (15.87%) patients. Therefore, FIGO classification was done in 599 out of 712 (84.13%) patients in Vojvodina.

As the distribution of ovarian cancer cases by FIGO stage classification was without statistical significance, we created linear trends using epidemiological data from Vojvodina. The linear trends of the reported cases in FIGO stage I and II for the period 2007-2012 showed ascending trends but it was also without statistical significance (p>0.05) (Figures 5 and 6). Epidemiological data for FIGO stages III and IV are summarized (Figure 7) and linear trend showed only moderate descending (p>0.05).

The average age of patient with diagnosed ovarian cancer was 55.94 years. The patients diagnosed with FIGO stage I and II were younger than patients with advanced disease (FIGO stage III-IV) in both regions. The difference in average age of patients based on FIGO classification was statistically significant (p < 0.0001) only for patients from Vojvodina (Figure 8).

Ovarian cancer was diagnosed in most patients that were older than 50 years,(p < 0.0001) (Figure 9).

DISCUSSION
The ovarian cancer is estimated as the most lethal malignant gynecological oncologic disease. The majority of the newly diagnosed cases are in advanced disease (3). In our study, majority of patients (≥ 60%) were diagnosed in advanced disease, FIGO stage III-IV, in both Vojvodina, Serbia and South Great Plain, Hungary. The results are comparable with UK epidemiological data where the most women are also diagnosed with advanced stage disease: 60% stage III, IV, and around 30% in the early stages I and II (13). Similar results reported Malenkovic et al. (14) for period 2001-2008 in Vojvodina. In both regions, we found similar percent
of patients in FIGO stage I and FIGO stage II. According to literature data, 56% of ovarian cancers are epithelial cancers by origin (15).

The results of histopathological analyses were also similar in our both regions. The most common epithelial ovarian cancer subtype in both regions was serous ovarian cancer. In 2009 in UK serous subtype accounted for one-third of all cases which is comparable with number of newly diagnosed serous ovarian cancer in Vojvodina (16). The higher prevalence of the serous ovarian cancer was diagnosed in South Great Plain. One of the reasons for such significant differences between two regions may be the higher percentage of unknown histopathological type: 18.82% in Vojvodina population and only 6.86% in South Great Plain.

Ovarian cancer is predominantly a disease of older women. Usually, it is diagnosed in women age around 60 years (3). The average age of patients in our study was 55.94 without significant difference between both regions. Our patients were older than 50 years in more than 80% that is in agreement with previous UK report (16).

In our study, advanced disease showed a moderate descending linear trend. Malenković et al. study (14) for the period 2001-2008 in Vojvodina, showed ascending linear trend, but also without statistical significance (14).

Diagnostic approaches in the preoperative identification of ovarian malignancy were also studied (17-22). It is suggested that 3D ultrasonography has higher sensitivity and specificity compared to 2D ultrasound (18, 19). In addition, morphological scoring systems have satisfying sensitivity and specificity (20-22). Explicit scoring systems such as risk of malignancy index (RMI), is based on the score obtained by ultrasound (U), menopausal status (M), and CA-125 data in the following manner: 

\[ \text{RMI} = U \times M \times \text{CA-125} \]

A cutoff of 200 was used to differentiate between malignant and benign masses in the original study (13). Two studies reported on diagnostic accuracy of RMI (23, 24). The overall sensitivity and specificity were 79.2% and 91.7%, respectively. These data were obtained by bivariate random effects model from 13 studies with 15 data sets (23, 24). In evaluation of the three imaging modalities (NMR, CT, PET), NMR appeared the best, but results were not statistically different from CT. PET did not have any better performance than CT or NMR. Tumor biomarker CA 125 was also considered for diagnosis of ovarian cancer. However, its frequent measurement was found to be less reliable than other available assessment methods. In summary, results of bivariate analysis of 51 studies (52 data sets) showed that overall sensitivity was 78.7% and specificity was 77.9% (17).

CONCLUSION

The vast majority of newly diagnosed ovarian cancer in Vojvodina, Serbia and South Great Plain, Hungary were patients with advanced disease stages. Newly diagnosed ovarian cancer was mostly found in women over 50 years old. Trends of FIGO classified stages in evaluated period did not show statistically significance fluctuation. The most diagnosed histological type was epithelial ovarian cancer and serous subtype in both regions. The results were comparable and similar to epidemiological data from the literature.
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Conflict of Interest
We declare no conflicts of interest.

REFERENCES: