

ORIGINAL ARTICLE

Organised cervical cancer screening programme in the Belgrade municipality of Cukarica - Evaluation of process indicators

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Summary

Purpose: To evaluate the process indicators for monitoring the Organized Cervical Cancer Screening Programme (OCCSP) conducted in the Belgrade municipality of Cukarica within the first three-year interval, and to compare Pap test coverage for women aged 25 to 64 before and after implementing the organised programme.

Methods: We analyzed the coverage by invitation, compliance with invitation and coverage by Pap test for the first three-year interval of the OCCSP (20th Dec 2012 - 19th Dec 2015) as well as the results of opportunistic screening for the same period and coverage by Pap test for women aged 25 to 64 for the last three years prior to the implementation of the OCCSP.

Results: After the first three years of the OCCSP implementation, coverage by invitation was 42.9%, compliance to invitation 66.7% and coverage by Pap test was 28.6%. During the same period, outside of the program (opportu-

nistic screening) coverage by Pap test was 9.4%. In the last three years prior to the implementation of the OCCSP coverage by Pap test for women aged 25 to 64 was 21.4%.

Conclusion: After the first three-year interval of the OCCSP implementation, the overall (organised + opportunistic) Pap test coverage for women aged 25-64 has almost doubled compared to the period when we conducted exclusively opportunistic screening (38.4 vs 21.4%). However, incentive payment for the smear takers and better coordination and planning of capacity-building is needed in order to achieve the 75% Pap tests coverage recommended by the National Programme for Early Detection of Cervical Cancer.

Key words: cervical cancer, opportunistic screening, organised cervical cancer screening programme, process indicators

Introduction

In Serbia, the opportunistic screening which was implemented into regular gynecological practice in the early sixties [1] did not achieve satisfactory results in the prevention of cervical cancer. According to the data presented by the International Agency for Research on Cancer (IARC) in 2012, Serbia is in third place in Europe for cervical cancer mortality, after Romania and Moldova [2]. Therefore, in order to improve this unfavorable epidemiological situation and after

harmonization of the previously established National Programme [3,4] with the European guidelines, the Ministry of Health has issued the Regulation on the National Programme for early detection of cervical cancer [5]. This program has been introduced in 2012 as an organised, decentralized programme for all women in Serbia aged between 25-64 years.

In the Belgrade municipality of Cukarica, the organized screening began on 20th December

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2012 and screening activities were integrated into the existing health care system. Estimated by the 2011 census, Cukarica has 194,234 inhabitants and only one primary health center (PHC) responsible for the implementation of the OCCSP. Papanicolaou smear test (Pap test) has been performed within a three-year screening interval and the recommended coverage was 75%.

Call/recall system for all women of the target population was enabled with the help of the PHC patient database, election lists and list of insured persons of the Republic of Serbia Bureau for Health Insurance. Women having had a hysterectomy or follow-up after treatments were not excluded from the invitations but were excluded from further screening process. Invitation to screening was supported by the social educational campaign "Serbia against Cancer" run under one slogan and logo across the whole country.

Sampling for Pap smears was done exclusively by the gynecologists at the PHC of Cukarica and sample quality of conventional smears was under continuous control by the reference cytological laboratories. Pap test results were reported in the 2001 Bethesda system. Patients with confirmed precancerous changes were sent to secondary care centers for further detailed medical exams.

However, in the PHC of Cukarica, in addition to the organised programme, a certain level of opportunistic screenings occurred outside the programme.

The aim of this study was to evaluate the process indicators for monitoring the OCCSP conducted in the Belgrade municipality of Cukarica within the first three-year interval. Also, our purpose was to compare Pap test coverage for women aged 25 to 64 before and after implementing the organised programme.

Methods

In this study we analyzed the coverage by invita-

tion, compliance with invitation and coverage by Pap test for the first three-year interval of the organized screening in the Belgrade municipality of Cukarica (from 20th December 2012 until 19th December 2015) as well as the results of opportunistic screening for women aged 25 to 64 for the same period.

We also analyzed the coverage by Pap test of opportunistic screening for women aged 25 to 64 for the last three years prior to the implementation of the organised programme (from 20th December 2009 until 19th December 2012).

The data source for calculating the process indicators was a specially designed computer database with on-line access to all records of screening. The indicators were calculated according to the formula presented in the European guidelines [6]. Because our recently established computer database does not contain any relevant data about the number of women who were hysterectomized or had a follow-up after treatments (non-eligible women) to calculate the coverage, we used the data on the total women aged 25-64 years in the middle of the second year of the OCCSP (2014) as estimated by the 2011 Census. The data are presented in Tables, statistically analyzed and commented.

Statistics

Descriptive statistical methods and methods of statistical hypothesis testing were applied in the primary data analysis. Statistics included relative numbers (structure indicators) and statistical hypothesis testing included high-quadrant test and the Fisher's test of exact probability. P values <0.05 were considered statistically significant. The data was analysed with the IBM SPSS 22 software package (SPSS Inc, Chicago, Ill, USA).

Results

After the first three years of the OCCSP implementation coverage by invitation was 42.9%, compliance with invitation 66.7% and coverage by Pap test was 28.6% (Table 1).

In the PHC of Cukarica, in addition to the or-

Table 1. Results of process indicators for the OCCSP in the Belgrade municipality of Cukarica after the first 3-year interval - from 20th Dec 2012 until 19th Dec 2015

<i>Parameters of screening</i>	<i>N</i>	<i>Comments</i>
Total inhabitants*	190022	Mid-year population (2014)
Target population* (TP)	57018	All resident women aged 25-64 years
Invited women (IW)	24434	Personal invitations (Call/recall system)
Screened women (SW)	16305	Invited women who were screened at least once
Screening indicators	%	Calculation
Coverage by invitation	42.9	IW / TP
Compliance with invitation	66.7	SW / IW
Coverage by PAP test	28.6	SW / TP

* mid year population (2014) estimated by 2011 Census

Table 2. Comparative results of screenings (organised vs opportunistic) for women aged 25 to 64 (three-year period before and after the implementation of OCCSP)

Last 3 years before the OCCSP (20 th Dec 2009 - 19 th Dec 2012)		First 3-year screening interval of OCCSP (20 th Dec 2012 - 19 th Dec 2015)			
Exclusively opportunistic screening		Screening indicators	Organised screening (OrS)	Opportunistic screening (OpS)	Total screening (OrS + OpS)
181231	Total inhabitants*		190022	190022	190022
56666	Target population (25-64)*	(TP)	57018	57018	57018
12117	Screened women - at least once**	(SW)	16305	5279	21584
21.4 %	Coverage by PAP test	(SW/TP)	28.6 %	9.4 %	38.0%

* mid year population (2011 vs 2014) - estimated by 2011 Census

**women who have already attended an organised screening followed by opportunistic screening are presented in the Table only in the context of organised programmes

ganised programme, a certain level of opportunistic screenings outside of the programme occurred. Comparative results of the screenings (organised vs opportunistic) for women aged 25 to 64 for the three-year period before and after the implementation of organised programmes are shown in Table 2.

Statistical analysis indicates that the total (organised + opportunistic) coverage by Pap test for women aged 25 to 64 was significantly higher after the implementation of the organized programme compared to the period when we conducted exclusively opportunistic screening (38.0 vs 21.4%, $p \leq 0.001$).

Discussion

There is general agreement that the high coverage and compliance with invitation among invited women is one of the most important factors contributing to the success of screening [7-9].

In the Belgrade municipality of Cukarica, after the first three-year interval of the organised screening, coverage by invitation was quite small (42.9%) due to lack of staff and medical resources. However, compliance with invitation was higher (66.7%) which can be attributed to a well-organized social campaign and greater awareness of women about the importance of cervical cancer screenings which was previously reported by other authors [10]. In developed European countries with a long tradition of screening and better medical resources, coverage by invitation is significantly higher, as for example in Italy 75% and in Finland even 98% [11].

After the first three-year interval of the OCCSP our results indicate that low rates of coverage by invitation (42.9%) are related to low rates of coverage by Pap test examination (28.6%) within organised programmes. During the same period,

coverage by Pap test for women aged 25 to 64 outside of the programme (opportunistic screening) was only 9.4%. Comparative results show that, after the implementation of the organised programmes, the overall (organised + opportunistic) three-year Pap test coverage of women aged 25-64 has almost doubled compared to the three-year period (20th Dec 2009 - 19th Dec 2012) when we conducted exclusively opportunistic screening (38.4 vs 21.4%). Although our screening results are improving, they are still quite modest compared to developed European countries. For example, in Slovenia, where the organized programme was implemented in 2003, coverage by Pap test is 68%, while in France and Finland it is over 70% [12].

In addition to the lack of staff and medical resources in the PHC of Cukarica, a system of incentive payments for gynecologists was never implemented in practice. Other authors also reported that better coordination and planning of staff resources and incentive payments to the smear takers significantly increased screening coverage rate [9,13]. Furthermore, studies show that only about 3% of Belgrade population are treated exclusively in private clinics [14]. This certainly can not significantly improve the overall Pap test coverage which is still far below the 75% recommended by the National Programme [5].

Conclusion

In the Belgrade municipality of Cukarica, in the three-year period prior to the implementation of the organised programme, Pap test coverage for women aged 25-64 was quite small (21.4 %). After the first three-year interval of the OCCSP implementation, the overall (organised + opportunistic) Pap test coverage for women aged 25-64 has almost doubled compared to the period when

exclusively opportunistic screening was conducted (38.4 vs 21.4%). However, incentive payment for the smear takers and better coordination and planning of capacity-building is needed in order to achieve the 75% Pap tests coverage recommended by the National Programme for Early Detection of Cervical Cancer.

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Conflict of interests

The authors declare no conflict of interests.

References

1. Perisic Z, Plesinac-Karapandzic V, Dzinic M, Zamurovic M, Perisic N. Cervical cancer screening in Serbia. *Vojnosanit Pregl* 2013;70: 86-89.
2. Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J et al. Cancer incidence and mortality patterns in Europe: estimates for 40 countries in 2012. *Eur J Cancer* 2013;49:1374-1403.
3. Republican expert commission for the prevention and control of cervical cancer The National Program For Cervical Cancer Prevention-organized screening program. Available on: [http://www.zdravlje.gov.rs/downloads/Zakoni/Strategije/Nacionalni Program Za Prevenciju Raka Grlica Materice.pdf](http://www.zdravlje.gov.rs/downloads/Zakoni/Strategije/Nacionalni%20Program%20Za%20Prevenciju%20Raka%20Grlica%20Materice.pdf)
4. Technical Assistance for the implementation of the National screening programme for colorectal, cervical and breast cancer in Serbia (09SER01 05/11/01). Republican expert commission for the prevention and control of cervical cancer The National Program for Organized Screening for Cervical Cancer. Available on: <http://arhivaprojekta.skriningsrbija.rs/sites/default/files/documents/NATIONAL-PROGRAM-FOR-PREVENTION-OF-CERVICAL-CANCER-22.10.2009.pdf>
5. Government of the Republic of Serbia. Regulation on the National programme for early detection of cervical cancer. Official Gazzete of the Republic of Serbia no. 73/2013
6. Arbyn M, Anttila A, Jordan J et al. European guidelines for quality assurance in cervical cancer screening (2nd Edn). WHO International Agency for Research on Cancer, 2008.
7. Acera A, Manresa JM, Rodríguez D et al. Analysis of three strategies to increase screening coverage for cervical cancer in the general population of women aged 60 to 70 years: the CRICERVA study. *BMC Womens Health* 2014;14:86.
8. de Sanjosé S, Ibáñez R, Rodríguez-Salés V et al. Screening of cervical cancer in Catalonia 2006–2012. *Ecancermedicalscience* 2015;9:532.
9. Naumovic T, Jovanovic V, Ilic D, Rakic U, Mirkov D, Perisic Z. Performance indicators collected from primary health centres included in organised cervical cancer screening programme in the Republic of Serbia. *J BUON* 2015;20:842-846.
10. Kesic V, Jovicevic-Bekic A, Vujnovic M. Cervical cancer screening in Serbia. *Coll Antropol* 2007;31 (Suppl 2):31-36.
11. Anttila A, Ronco G. Description of the national situation of cervical cancer screening in the member states of the European Union. *Eur J Cancer* 2009;45:2685-2708.
12. Anttila A, von Karsa L, Aasmaa A et al. Cervical cancer screening policies and coverage in Europe. *Eur J Cancer* 2009;45:2649-2658.
13. Quinn M, Babb P, Jones J, Allen E. Effect of screening on incidence and mortality from cancer of cervix in England: evaluation based on routinely collected statistics. *BMJ* 1999;318:904-908.
14. Institute for Economic and Social Research, Development of the National Health Accounts of Serbia: the assessment of the private sector in health care. Belgrade 2009, 3-14 (in Serbian).