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Pelvic Examinations for Ovarian Cancer Screening in Asymptomatic Adult Women

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Abstract

There is discrepancy amongst organizations and the medical community whether bimanual pelvic examinations should be performed in asymptomatic women for routine screening. The purpose of this literature review was to determine whether bimanual pelvic examinations are beneficial for screening for ovarian cancer in comparison to no screening. In addition, research was conducted to see if healthcare providers' professional beliefs align with the evidence and national recommendations, to determine women's thoughts and beliefs regarding pelvic examinations, and identify other screening methods if bimanual pelvic exams are determined to be an invalid screening tool. Throughout reviewing peer reviewed articles and high-quality evidence, it was found that bimanual pelvic exams have low sensitivity for screening, which is not ideal due to false positives; however, several researchers still feel this is an important screening tool. Also, many providers still consider the pelvic exam beneficial when performed annually on asymptomatic women as part of a well-woman exam and continue to perform them routinely in the office. Research also shows that the majority of women do not feel uncomfortable or pain during a pelvic exam and the majority wish to continue having them performed on a regular basis. Combinations of different screening methods such as pelvic examination with serum CA-125 annually and serum CA-125 with transvaginal ultrasound annually were found to be effective in screening for ovarian cancer in asymptomatic women.

Keywords: bimanual pelvic examination, pelvic exam, ovarian cancer screening, CA-125, transvaginal ultrasounds, gynecological screening, adnexal mass, asymptomatic women

Introduction

- Prior to 2013, Pap testing was performed annually for cervical cancer screening and typically a pelvic examination would be performed in addition to a Pap every year
- In 2013, the American College of Obstetricians and Gynecologists (ACOG) changed the recommendations for performing Pap testing from annually to every 3 years alone or 5 years if co-testing with HPV
- It is not clearly defined if pelvic examinations should be continued annually for ovarian cancer screening

Statement of the Problem

- 70% of ovarian cancer cases are diagnosed late, usually beyond the possibly of a cure (Chagas, E. & Brazil, A., 2016)
- Most women with tumors of the ovaries or fallopian tubes are asymptomatic and approximately 75% of ovarian cancer diagnoses are metastatic with poor survival rates even with treatment (Adonakis, Paraskevaidis, Tsiga, Seferiadis, & Lolis, 2016)
- Ovarian cancer that is found only in the ovary and has not metastasized has a 5-year survival rate of 92% compared to a 5-year survival rate of 30% with metastatic ovarian cancer
- A screening tool with high sensitivity is important to detect these findings early
- Since the frequency of Pap tests has decreased, there has been much debate within the medical community on the frequency of pelvic examinations or if they are even beneficial at all in asymptomatic adult women

Research Questions

- In asymptomatic women who receive Pap screenings every 3 or 5 years, are pelvic exams beneficial for ovarian cancer screening in comparison to no screening?
- Do healthcare provider's professional beliefs align with the evidence and national recommendations?
- What are women's thoughts and beliefs regarding pelvic examinations?
- If pelvic exams are not beneficial, what other screening methods are available for ovarian cancer?

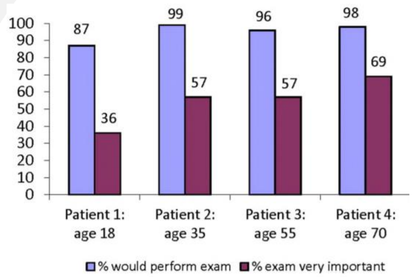
Literature Review

- Abenhaim, Titus-Ernstoff, & Cramer (2007) found that women with ovarian cancer were significantly less likely to have an annual medical visit and pelvic exam (Table 1)
- The Prostate, Lung, Colorectal and Ovarian cancer screening (PLCO) trial found sensitivity for ovarian palpation for cancer was 5.1%, specificity was 99.0%; pelvic exams were removed from the study after 5 years (Doroudi, Kramer, & Pinsky, 2016)
- The study conducted by Padilla, Radosevich, and Milad (2000) found adnexal masses with bimanual palpation 8% of the time (sensitivity was 15-33%, specificity was 79-92%) while women were under general anesthesia with a Foley placed
- The American College of Physicians (ACP) gives a strong recommendation to not perform pelvic exams on asymptomatic women based off low sensitivity, additional costs, and possible harm. Most literature that the recommendation is based on is >10 years old (Qaseem, Humphrey, Harris, Starkey, & Denberg, 2014).
- Henderson, Harper, Gutin, Saraiya, Chapman, & Sawaya (2013) surveyed ob/gyn providers with 4 vignettes with asymptomatic women not needing a pap; nearly all would perform a pelvic exam (Figure 1)
- Kling et al. (2017) found that 92.4% of women had pelvic exams performed on a regular basis either annually or every 2-5 years, and after reviewing the new ACP guidelines, 86.7% will continue regular pelvic exams
- Combining serum CA-125, bimanual pelvic examination, and transvaginal ultrasound for ovarian cancer screening had 100% sensitivity, 99.7% specificity, and PPV of 22% which is effective for screening (Adonakis et al., 1996) (Table 2)
- The PLCO did not find that CA-125 or TVU screenings significantly reduces mortality but both have a higher sensitivity than pelvic exams; found a 35% reduction in mortality which was not statistically significant (p=0.05) (Buys et al., 2011)
- Van Nagell et al. (2007) found TVU had PPV of 27.1% and NPV of 99.9%.
  - Those with annual screenings with TVU and diagnosed with ovarian cancer had a 92.1% 2-year survival rate in comparison with the general population with unknown or no screenings had a 2-year survival rate of 70.7%
  - 82% of the women in the study with ovarian cancer were found in stage I or stage II compared to the general population of women diagnosed with stage I or II being 34%
- The UK Collaborative Trial of Ovarian Cancer Screening (UKCTOCS) showed optimistic results by combining TVU and CA-125 with sensitivity of 89.4%, specificity of 99.8%, and PPV of 43.3% (Menon et al., 2009)

Figure 1: Patient vignettes and thoughts of practitioners on pelvic exam

Patient 1	An 18-y-old woman presents to you for a routine health visit. She became sexually active 1 mo ago. She has no history of dysplasia, is not immunocompromised, has no symptoms, and is not pregnant.
Patient 2	A 35-y-old woman with no new sexual partners in last 5 y presents for a routine health visit. She has had 3 consecutive normal annual Pap tests with you, last of which was 1 y ago. She has no history of dysplasia, is not immunocompromised, has no symptoms, and is not pregnant.
Patient 3	A 55-y-old woman presents to you for a routine health visit. Her cervix and ovaries were removed last year at time of hysterectomy for symptomatic fibroids. She has no history of dysplasia, is not immunocompromised, and has no symptoms.
Patient 4	Healthy 70-y-old woman presents to you for a routine health visit. She has had annual Pap tests with normal findings for past 30 y. She has not been sexually active for last 10 y. She has no history of dysplasia, is not immunocompromised, and has no symptoms.

For each vignette, respondents were instructed, "For this patient, please indicate whether you would perform each of following"; and, "For this patient, please indicate your opinion about importance of each of following." Clinical services listed were: (1) Pap test, (2) human papillomavirus test, (3) visual inspection of external genitalia, (4) speculum examination, (5) bimanual pelvic examination without rectal examination, and (6) bimanual pelvic examination with rectal examination.



Note. Adapted from "Routine bimanual pelvic examinations: Practices and beliefs of US obstetrician-gynecologists", by J. T. Henderson, C. C. Harper, S. Gutin, M. Saraiya, J. Chapman, and G. F. Sawaya, 2013, *American Journal of Obstetrics & Gynecology*, 208, p. 109.e1-7. Copyright: 2013 by Mosby, Inc.

Table 1: Ovarian cancer risk based on medical visit frequency, pelvic examination, and type of healthcare provider

	All participants			Premenopausal women			Postmenopausal women		
Variable	No. of cases n = 668	No. of controls n = 721	Adjusted* OR (95% CI)	No. of cases n = 310	No. of controls n = 337	Adjusted* OR (95% CI)	No. of cases n = 358	No. of controls n = 384	Adjusted* OR (95% CI)
No. of medical visits									
≥ 5	474	550	1.0	203	233	1.0	271	317	1.0
3-4	56	54	1.2 (0.8-1.8)	37	32	1.5 (0.9-2.5)	19	22	1.0 (0.5-1.9)
1-2	96	100	1.1 (0.8-1.6)	55	59	1.1 (0.7-1.7)	41	41	1.2 (0.7-1.9)
0	41	17	2.8 (1.5-5.0)	15	13	1.2 (0.5-2.7)	26	4	7.7 (2.6-23.0)
0†	41	17	2.4 (1.3-4.7)	15	13	1.1 (0.4-2.8)	26	4	5.6 (1.8-17.3)
No. of pelvic examinations									
≥ 5	452	537	1.0	198	253	1.0	254	284	1.0
3-4	60	64	1.1 (0.7-1.6)	41	36	1.5 (0.9-2.4)	19	28	0.7 (0.4-1.4)
1-2	91	102	1.0 (0.7-1.4)	48	43	1.4 (0.8-2.2)	43	59	0.8 (0.5-1.3)
0	63	18	3.9 (2.2-6.9)	23	5	5.0 (1.8-14.2)	40	13	3.3 (1.7-6.5)
0†	63	18	2.9 (1.6-5.3)	23	5	3.3 (1.1-9.9)	40	13	2.3 (1.1-4.7)
Health care provider									
OB/GYN	151	167	1.0	104	112	1.0	47	55	1.0
Other physician	463	519	0.9 (0.7-1.2)	181	199	0.8 (0.5-1.1)	282	320	1.1 (0.7-1.7)
Non-physician	19	24	0.8 (0.4-1.6)	12	17	0.6 (0.3-1.3)	7	7	1.4 (0.4-4.3)
No provider	33	11	2.7 (1.3-5.7)	12	9	0.8 (0.3-2.1)	21	2	12.5 (2.7-57.6)
No provider†	33	11	2.2 (1.0-4.8)	12	9	0.8 (0.3-2.4)	21	2	7.4 (1.5-36.1)

Note: OR = odds ratio, CI = confidence interval, OB/GYN = obstetrician-gynecologist.
*Adjusted for age, parity, ethnic background, education, marital status, religion and family history of breast or ovarian cancer.
†Adjusted additionally for smoking, body mass index, hormone replacement therapy, oral contraceptive pills, over-the-counter medications, prescription medications, multivitamins, talc for genital hygiene, tubal ligation and ovarian cystectomy.

Note. Adapted from "Ovarian cancer risk in relation to medical visits, pelvic examinations, and type of health care provider", by H. A. Abenhaim, L. Titus-Ernstoff, and D. W. Cramer, 2007, *Canadian Medical Association Journal*, 176(7), p. 941-947. Copyright: 2007 by the Canadian Medical Association or its licensors.

Discussion

- The U.S. Preventive Services Task Force (USPSTF) states:
  - there is not enough evidence to be for or against routine screening with pelvic examination
  - unsure of the benefits versus the harms because of the lack of studies
  - has not given a recommendation with a *Grade I* for insufficient evidence (USPSTF, 2017)
- The American Academy of Family Physicians (AAFP) recommends against pelvic exams
  - *Grade D* for evidence of little benefit and possible harm (AAFP, 2017)
- ACOG recommends annual pelvic exams at well-woman visits based on expert opinion, discussion should be had between patient/provider and come to a shared decision (ACOG, 2016)
- Overall, current evidence that supports performing pelvic examinations is not strong and is outdated
- Ovarian cancer is usually detected late with a low 5-year survival prognosis, and if bimanual exams may find some of these cases earlier, it is worth performing
- Pelvic exams have a high benign findings rate which can lead to additional cost, testing, anxiety, and possibly unnecessary surgery, however, these are necessary to find some cases of ovarian cancer early
- All studies reviewed that were conducted to evaluate provider's practices and beliefs show that the majority of providers, especially OB/GYN, still feel bimanual pelvic exams are an important part of the well-woman visit
- Combining different screening methods (serum CA-125, TVU, pelvic exam) for ovarian cancer has proven to be effective but cost was not considered, further study needs to be completed and insurance coverage would be necessary for other screening methods

Application to Clinical Practice

- Providers should discuss the potential risks and benefits of performing bimanual pelvic examinations and reach a mutual decision
- Each woman should be treated as their own individual with all their medical history taken into account in the decision making
- It should not be assumed that bimanual exams do not need to be performed anymore nor that they should be performed annually without discussion
- If a woman does not wish to decide or would like professional advice, based on common practice of expert providers, it should be advised to perform them annually
- There are no other screening tests covered by insurance for ovarian cancer screening. Therefore, pelvic examinations with low sensitivity will remain standard practice until further studies, research, or guidelines suggest otherwise

Table 2: Specificity, sensitivity and positive predictive value

	Specificity	Sensitivity	P.P.V.
Pelvic examination	97.20%	66.67%	3.39%
CA-125	99.25%	100%	16.67%
Pelvic examination + CA-125	99.70%	100%	22.22%
Pelvic examination + CA-125 + ultrasound	99.70%	100%	22.22%

Note: Adapted from "A combined approach for the early detection of ovarian cancer in asymptomatic women", by G. L. Adonakis, E. Paraskevaidis, S. Tsiga, K. Seferiadis, and D. E. Lolis, 1996, *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 65, p. 221-225. Copyright: 1996 by Elsevier Science Ireland Ltd.

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