



Video-assisted genetic counseling in patients with ovarian, fallopian and peritoneal carcinoma



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HIGHLIGHTS

- A new method of genetic counseling for ovarian cancer patients is proposed.
- Patients were shown a genetic counseling video and offered immediate testing.
- A significantly larger proportion of patients were tested using this new algorithm.

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ABSTRACT

Objectives. To compare the proportion of patients with ovarian, fallopian or peritoneal carcinoma who receive genetic testing after observing a genetic counseling video versus after traditional referral for genetic counseling and testing at physician discretion.

Methods. A retrospective chart review was performed of all patients seen at the West Cancer Center for evaluation of ovarian, fallopian or peritoneal carcinoma from 7/2014 to 8/2015. Patients seen between 7/2014 and 12/2014 were offered standard genetic counseling. We adopted a new standard of care from 3/2015 to 8/2015 involving the use of a genetic counseling video on a digital tablet. The video was shown to patients with ovarian, fallopian or peritoneal cancer, who were then given the option to undergo genetic testing at the end of the viewing. We compared the number and proportion of patients who received genetic testing in both groups.

Results. The initial group of 267 patients received referral and testing at the physician's discretion between 8/2014 and 12/2014. 77/267 (29%) of these patients underwent genetic testing. 295 patients viewed the condensed genetic counseling video with the option to receive testing the same day between 3/2015 and 8/2015. 162/295 (55%) of these patients received testing. The transition from a referral method to the video counseling method resulted in a significant increase of patients tested ($p < 0.001$).

Conclusion. Using a genetic counseling video and providing an immediate option for testing significantly increased the proportion of patients with ovarian, fallopian or peritoneal carcinoma who received genetic testing.

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1. Introduction

The process of genetic counseling and testing in ovarian cancer patients is becoming an increasingly crucial aspect of patient care in this population [1,2]. Ovarian cancer claims the highest mortality rate of all gynecologic cancers and has the strongest connection to hereditary syndromes, particularly BRCA1/2 [2]. The finding of a pathogenic variant of BRCA1/2 in a patient is important, not just for the benefit of family members and the prevention of future disease, but for the approach to

the patient's treatment: The advent of poly(ADP-ribose) polymerase (PARP) inhibitors marked the beginning of the likely exponential growth of molecular directed therapies in cancer treatment. [3].

NCCN, ASCO and SGO guidelines now recommend BRCA1/2 testing in all patients with a diagnosis of epithelial ovarian, peritoneal or fallopian carcinoma [4–6]. National practice falls significantly short of this, with physician referral often depending on family history and age at diagnosis; cited national testing rates range from 14 to 25% [2,7]. Perhaps more importantly, as many as 16% of mutation carriers would not have been identified by family history [3].

Although universal testing is now the standard of care, the process of counseling and testing needs to be improved upon, especially in areas of high patient volume or with limited access to genetic counselors [2,7]. While attempts have been made at new service delivery models, there

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is still no definitive or widely used algorithm for genetic counseling education [8]. We sought to establish an integrated model of concise education with immediate access to testing by utilizing a condensed genetic counseling video. We then compared the proportion of patients with ovarian, fallopian or peritoneal carcinoma who received testing using this method versus using the traditional referral method.

2. Methods

A retrospective chart review was performed of all patients seen at the West Cancer Center in Memphis, TN for evaluation of ovarian, fallopian or peritoneal carcinoma from 7/2014 to 8/2015. Patients seen between 7/2014 and 12/2014 were offered standard genetic counseling and testing at physician discretion during their initial appointment. The traditional counseling method involved the referral of patients at physician discretion to a certified genetic counselor. This appointment took place at a later time, involving approximately 30–45 min of face-to-face conversation and education, followed by the option of BRCA1/2 testing with reflex to a multi-gene panel.

Physicians had access to a new method of patient education and testing that was adopted from 3/2015 to 8/2015. Patient with ovarian, fallopian or peritoneal cancer seen during this period were instead shown a condensed, standardized counseling video on a tablet during their appointment at the physician's discretion. Those patients whose insurance required traditional genetic counseling prior to testing were not able to receive video counseling. The video was created by a certified genetic counselor at West Cancer Center. It is 7 min long and consists of a discussion of genes and mutations, red flags for hereditary cancer, a review of BRCA1/2, the possibility of finding other mutations, potential impact on family members, the legal protection of genetic information, and the interpretation of test results.

All patients were electronically given the option to undergo BRCA1/2 testing at the end of the video per NCCN guidelines; they were also given the option to reflex to a comprehensive multi-gene panel if BRCA testing was negative. Final results were discussed with all patients. Patients with positive results underwent formal consultation with a genetic counselor. We compared the number and frequency of patients who received genetic testing in both groups. Demographic characteristics, including age at diagnosis, BMI (body mass index), race, disease stage and disease grade, were compared. Statistical package for the social sciences was used to analyze the data; a chi square test was used to compare the discrete variables and a *t*-test was used for continuous variables.

3. Results

A total of 562 patients were included in the study. Demographic details of these patients are provided in Table 1. No demographic characteristics were significantly different between the two groups, including age, race, BMI, disease stage or disease grade. 267 patients received referral and testing at the physician's discretion between 7/2014 and 12/2014. 77/267 (29%) of patients in the traditional referral group ultimately underwent genetic testing (Table 2). 295 patients viewed the condensed genetic counseling video with the option to receive

testing the same day between 3/2015 and 8/2015. Among patients who viewed the counseling video and were offered testing the same day as their initial visit, 162/295 (55%) received testing (Table 3). The transition from a referral method to the video counseling method resulted in a significant increase of patients tested ($p \leq 0.001$) with a 95% confidence interval 0.26 ± 0.08 (0.18–0.34). There was not a significant difference in mutation detection rate between the two groups: 21/267 or 7.9% had detected BRCA mutations in the traditional group; 24/295 or 8.1% of patients had detected BRCA mutations in the video counseling group ($p = 0.91$). 5/267 (1.9%) in the traditional group had other detected mutations; 9/295 (3%) had other detected mutations in the video counseling group ($p = 0.37$).

4. Discussion

Our study demonstrates a significant increase in the proportion of patients tested when using the video counseling method versus the traditional referral method. This alternative education and testing algorithm could be a potential tool to adhere to NCCN guidelines concerning genetic testing in this patient population.

Approximately 13–17% of ovarian cancer patients have a germline BRCA mutation [9]. The diagnosis of a BRCA1 mutation carries a 40% lifetime risk of ovarian cancer; that of BRCA2 a 20% lifetime risk [10,11]. Within the last two years, SGO, ASCO and NCCN have all concluded that universal testing of all patients with epithelial ovarian, fallopian or peritoneal carcinoma should be standard of care. This standard, however, has proven difficult to implement. A large percentage of patients are unaware BRCA genetic testing or its applicability to their diagnosis, treatment or family members [12]. A recent article that reviewed the counseling and testing practices of oncology centers from 22 collaborative groups in 19 different countries found that only 55% routinely offer BRCA testing to all women with ovarian cancer [2]. This disparity is likely secondary to remaining dependence on high-risk paradigms for referral determination [2].

Several models exist for stratifying risk, including the Myriad and Manchester scoring system, but these systems have been found to consistently underestimate the probability of mutation detection [13]. Multiple studies demonstrate that family history alone cannot accurately detect all population mutations [10,14]. Moller et al. found, after testing all women who presented to their clinic with ovarian carcinoma, that only one third of the 23% with a BRCA1/2 mutation would have met testing requirements by their family history [14].

Conversely, the DNA-BONus trial found that when an adequate pedigree was obtained, current testing criteria based on age and family history were actually sufficient in identifying all mutations. Despite this finding, there was a higher than average percent of pathogenic variants in this ovarian cancer patient population (22.3%) leading the authors to conclude that testing should be offered to all patients with epithelial ovarian cancer [15].

The increasing demand for an expansion of BRCA1/2 testing in patients with ovarian, fallopian or peritoneal carcinoma has created a need for a streamlined education and referral process. Lheureux et al., after surveying current BRCA1/2 testing practices across multiple institutions, concludes that “the current BRCA1/2 testing/counseling paradigm may be suboptimal,” and recommends seeking “alternative strategies to provide real time information” [2].

Various alternative strategies have been suggested, including telephone counseling, computer-based decision modules and group counseling. Telephone counseling was found to be equally efficacious in regards to patient education; however, testing rate was lower in the telephone counseled patients, likely because patients who opted for telephone counseling lived in remote areas [16]. Green et al. compared standard counseling to a computer based decision aid for breast cancer patients [17]. Although the computer-based model was more effective at educating patients, testing decisions did not differ significantly between the computer and counselor group. In this study, testing was

Table 1
Demographics.

	Traditional (n = 267)	Integrated (n = 297)
Age	58.9	59.5
Race (%)		
Black	17.8	19
White	79.5	78.8
Other	2.7	1.8
BMI	30.4	29.3
Late stage (%)	62.7	65.1
High grade (%)	75.6	73.1

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