

Original Article

Patient awareness, disease-specific knowledge, and patient adherence to endovascular treated elective infrarenal abdominal aortic aneurysm

 Gokay Deniz,  Serkan Mola,  Hakki Zafer Iscan,  Muhammet Selim Yasar,
 Alp Yildirim,  Naim Boran Tumer,  Anil Ozen

Ankara Bilkent City Hospital, Cardiovascular Surgery Clinic, Ankara, Türkiye

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Abstract

Aim: Patient awareness and disease-specific knowledge are essential for shared decision-making of patients with abdominal aortic aneurysms. With this pilot survey, we aimed to figure out the obstacles to patient's awareness about the aortic aneurysm before and after the procedure.

Material and Methods: Patients who experienced elective endovascular aortic aneurysm repair (EVAR) in our Cardiovascular Surgery Clinic between 2019 to 2023 were the selected patient cohort. The first 50 patients who visited our outpatient clinic were given a questionnaire about their awareness of the aneurysm disease, disease-specific knowledge, and the comprehensibility of the patient information provided before and after the procedure.

Results: The mean age of our patients was 66±6.9. Younger patients were more aware of the situation before the information ($p=0.013$). Patients anxious about the disease were also more conscious about the aortic aneurysm ($p=0.02$). Although all patients were given preoperative information and disease-specific information by the same team, 13 patients (26%) could not recall anything about the disease and did not recall what operation was performed and why. Thirty-seven patients (74%) gained awareness about the disease. The patients with at least an educational level above high school gained more awareness than others ($p=0.04$).

Conclusion: The Classical informatory model seems insufficient for gaining awareness and consciousness for older patients and with patients with low level of education. Strengthened patient-practitioner interaction with supplemental technologies (leaflets, interactive media, audio tapes, etc.) may improve these patients' shared decision-making. More prospective research is required in this regard.

Keywords: EVAR, patient education as topic, teach-back communication

CITATION

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Corresponding Author: Serkan Mola, Ankara Bilkent City Hospital, Cardiovascular Surgery Clinic, Ankara, Türkiye
Email: srkn.mola@gmail.com

INTRODUCTION

The first modern open surgical repair (OSR) of infrarenal abdominal aortic aneurysm (iAAA) was performed in 1951, and nearly 40 years later endovascular technique was presented [1,2]. The technique started with high-risk surgical patients, and then since traditional surgeons felt hesitant about this innovation, the patients were shifted to other specialists for endovascular treatments. As a result, no other chance was given to cardiovascular surgeons to perform endovascular procedures or they would lose the patient cohort to other specialists.

The EVAR-1, DREAM, and OVER studies revealed that EVAR reduced early mortality and morbidity over 2-4 years. Moreover, older-generation endografts with constitutional defects have been utilized in these randomized controlled studies, which were criticized [3-5]. Innovative technological improvements and the new generation of devices seemed to surpass older devices' complications and long-term limitations, and physicians were also gaining experience. Therefore, EVAR has become the treatment preferred for all physically suitable patients except young ones. Nevertheless, there is a lack of consensus regarding choosing treatment for iAAA, with the decision often dependent upon aspects such as patient preferences, familial considerations, practitioner perspectives, and experience of healthcare facilities.

Cardiovascular surgery deals with all treatment options for an aneurysm patient, whether medical, endovascular, or conventional OSR and is conscious of all risk profiles of all kinds of treatments. In order to enhance patients' awareness and consciousness, cardio-endovascular surgeons must provide clear explanations of the potential benefits and harms associated with treatments, and also of their disease-specific risks. In this regard, cardiovascular surgeons should aid patients' decisions without bias or conflict of interest. The best therapy should be chosen through shared decision-making with informed consent.

In today's world, patients and/or families have some information about iAAA and treatments and somehow have already made their treatment decision, forcing health professionals to perform so. On the other hand, patient education and informed consent to family is a fundamental responsibility of the surgeons in charge. There are few studies about patient awareness or disease-specific knowledge [6-11]. Current guidelines include patient education about the disease and possible treatments [12,13].

The current study aimed to evaluate the aneurysm disease from the patient's perspective. These are the preliminary results of our questionnaire study on awareness and disease-specific knowledge of patients who experienced elective EVAR.

MATERIAL AND METHODS

Ethical approval for this study was obtained from Hospital

Clinical Research and Ethics Committee (15.12.2021/E1-21-2226). Informed consent was obtained from all patients.

Patients who experienced elective EVAR in our Cardiovascular Surgery Clinic between 2019 to 2023 were the selected patient cohort. This pilot study is the first part of our ongoing survey study, and the first 50 patients were admitted randomly. The same cardio-endovascular surgeon team who performed the procedures created the questions. Age, educational level, and demographic data were recorded in the first attendance. Patients were grouped according to their level of education: high educated, defined as having completed high school or university, and low educated, defined as having completed elementary school or not educated. It was noted by which diagnostic method and in which clinic the patients were first diagnosed. Individuals who engaged in active internet usage and those who used the internet to acquire any information were identified. All patients were evaluated according to the awareness of their disease. The level of awareness was scored as 1 point for those who had any information about abdominal aortic aneurysms, 2 points for those who knew their aneurysm diameter in addition, and 0 points for patients who had no information. Classical verbal information was then stated that the disease had been called basically a balloon inside the body located at the aorta, and the diameter was expressed as that if the balloon was large, the rupture or mortality risk could be high. EVAR, OSR, and no intervention options (only medical treatment) were explained, including "life-long surveillance" following EVAR. The pros, cons, and eventual outcomes were clarified. All patients were informed, and what they had learned was evaluated. Written informing leaflets were given. After informed consent, EVAR was performed on the patients. No mortality or morbidity was encountered. The following appointment after the operation, patients were questioned again, and the patient's awareness was rated. We questioned whether the patients knew about their aneurysm and its features, treatment, and following process. The patients were grouped in two; "as those who gained awareness", defined as having any awareness about the iAAA, and "as those who did not gain awareness", defined as having no information about the disease or treatment.

Our primary endpoint is to explore the factors included in gaining awareness after verbal information and define which informatory is inadequate for which patients. The secondary endpoint is to determine the characteristics of the patients having disease-specific knowledge at the first attendance.

Statistical analyses were performed using SPSS for Windows version 20.0 software (SPSS Inc., Chicago, IL, USA). Continuous variables were expressed in mean±standard deviation (SD), while categorical variables were expressed in number and frequency. Means were compared using Student T-test, and categorical data were compared using the Fischer Exact and chi-square test, where appropriate. The predictors for awareness, including age, gender,

anxiety, the outpatient clinic where the patient was diagnosed, and educational status, were analyzed for univariate and multivariate logistic regression analysis. Statistical significance was taken as $p < 0.05$, and 95% confidence interval limits were given.

RESULTS

All patients were informed before the EVAR procedure about the disease. The mean age of our patients was 66 ± 6.9 years (56-86 years). Among the cohort, 29 patients were asymptomatic (58%). The number of patients who received a diagnosis upon ultrasonographic evaluation were 10 (Table 1).

Two of these patients were evaluated due to urologic symptoms. The other two had abdominal symptoms. Therefore, we may conclude that only six patients (12%) in this cohort were asymptomatic and had visited for routine ultrasonographic check-ups. The first clinic that the patient visited is given in Table 1. Among the cohort, 62% of patients first visited the Cardiovascular Surgery Clinic. The second most visited clinic was Urology, depending on the visualization of aortic dilatation, while ureteropelvic (primarily prostate) ultrasonographic (USG) or computed tomographic (CT) evaluation was performed. As the study was constructed during the Covid-19 pandemic, the emergency department was also one of the first visited departments. Four patients presenting with Covid-19 symptoms from the pulmonary disease department and two presenting with initial symptoms of abdominal pain from the emergency department were referred to the Cardiovascular

Surgery department following CT evaluation. When all patient cohort was evaluated, 61% were first consulted to or visited the Cardiovascular Surgery Department (Table 1).

Before giving the information about disease and treatment, pre-conscious and disease-specific knowledge was questioned. Fifteen patients (30%) had any information about their disease, whereas four (8%) were aware of the diameter of the aneurysm and treatment options. Thirty-five patients (70%) were unaware of their disease despite being diagnosed and consulted with us. Patient's awareness was shown regarding the patient's educational level; low-educated patients had low awareness ($p=0.009$) (Figure 1).

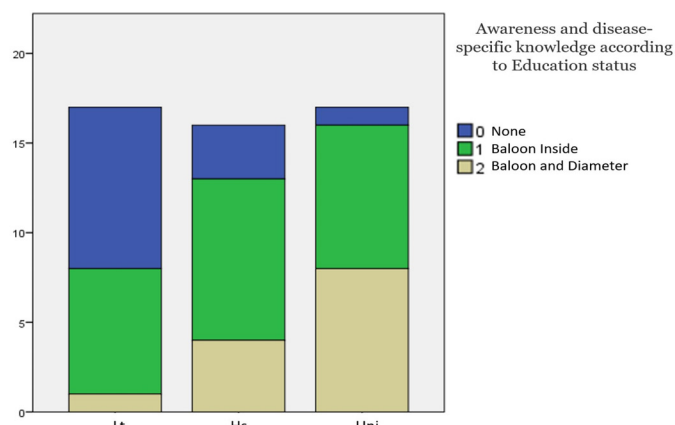


Figure 1. The awareness and disease specific knowledge according to education status of the patients

Table 1. The features of EVAR participants and demographic data

Age	Mean:66	Sd:6.9
Gender	1 female	49 males
Symptoms		
Asymptomatic	n=29	58%
Symptomatic	n=21	42%
The first clinic where the patients were diagnosed		
Cardiovascular	n=31	62%
Pulmonary diseases	n=4	8%
Cardiology	n=5	10%
Urology	n=8	16%
Emergency	n=2	4%
The first diagnostic test		
USG	n=10	20%
CTA	n=40	80%
Education status		
Literate	n=17	34%
High school	n=16	32%
University	n=17	34%
Other seatures		
Anxiety	n=20	40%
Smoking	n=22	44%
Internet	n=18	36%

The relationship between age and awareness regarding the disease was studied; younger patients were found to be more conscious or aware of the situation ($p=0.013$). However, no cut-off age limit could be given. The patients with anxiety about their disease were also the patients who had disease-specific knowledge ($p=0.001$) (Table 2).

Table 2. Awareness level of the patients before the information

	No awareness n=35	Having Awareness n=15	p-value
Age	67.57 Sd:7.21	62.33 Sd:4.59	0.013
Symptomatic	16	5	0.416
CVS clinic	23	8	0.409
Education (Literate)	16	1	0.009
Anxiety	8	12	0.001
Internet	12	6	0.700

All patients were informed about iAAA and the treatment

options. Our cohort consisted of patients who were treated with EVAR. Twenty patients decided their priority was the endovascular solution. Four patients (8%) insisted on their treatment modalities even though they were recommended that open surgical repair was more suitable because of their younger age and/or other aneurysmal morphologic specifications (hostile neck, tortuosity, or atherosclerotic restrictions). Finally, EVAR operation was performed for all by the same endovascular team. We arranged the first control outpatient appointment and rated the patient's gaining awareness (Figure 2).

Although all patients had preoperative information and disease-specific information was given by the same team, 13 patients (26%) could not recall anything about the disease and did not recall what operation was performed and why. Thirty-seven patients (74%) were aware of the condition and what was performed, whereas 13 (26%) were aware of the diameter of the aneurysm. Receiving classical verbal information about the disease could not improve the patient's awareness for 11 (22%) (Figure 3).

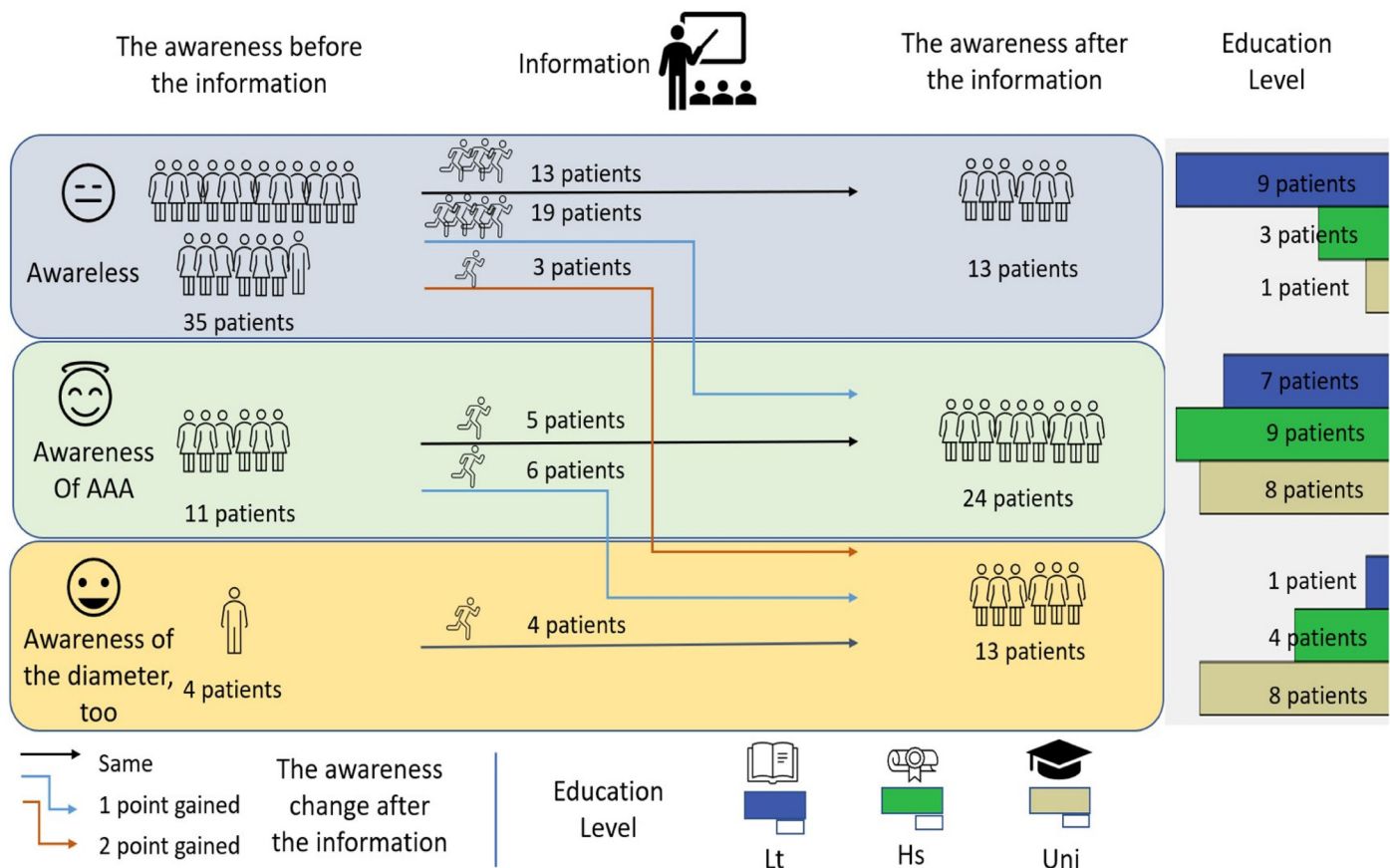


Figure 2. Visual abstract about the awareness, patient information, and improving awareness or disease-specific knowledge. Lt: Graduated from primary school. Hs: Graduated from high school. Uni: Graduated from university. No awareness: Knowing nothing about their own disease, Awareness of AAA (Having 1 point): Knowing about their own disease Awareness of the diameter, too (Having 2 points): Beside knowing about their own disease, he or she knows about the aneurysm diameter, segment, treatment options. Information: Providing disease specific knowledge at the first approval

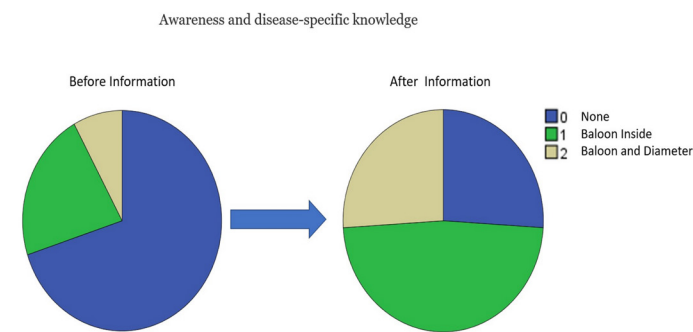


Figure 3. The change after the information of the patient and family at the control after the EVAR procedure

The predictor factors on having any awareness and gaining consciousness about disease were investigated. When educational levels were evaluated in two groups; those graduated from primary school or those graduated from a higher level (graduated from high school and graduated from university). Education level had a statistically significant effect on awareness and gaining consciousness ($p=0.033$). Getting information from the internet did not provide enough awareness and consciousness about the disease and treatments ($p=0.68$). In multivariate analysis, only age significantly affected having awareness and gaining consciousness about the disease. Because younger participants were more educated, educational level was calculated insignificant as mismatched (Table 3).

Table 3. Predictors of gaining awareness

	Univariate OR (95%CI)	p-value	Multivariate OR (95%CI)	p-value
Age	0.84 (0.75-0.94)	0.03	0.80 (0.68-0.95)	0.012
Education (Lt)	0.24 (0.07-0.94)	0.04	0.48 (0.06-3.69)	0.488
Anxiety	3.04 (0.79-11.94)	0.10		
Internet	1.29 (0.37-4.46)	0.68		

DISCUSSION

Over the years, the doctor-patient interaction at the final decision in a life-threatening disease has been controversial. After the paternalistic model in the doctor-patient relationship has been obsoleted, shared decision-making has been recommended. In the modern world, the informative model is mostly used, and the decision-making or to final decision is left to the patient as the main consumer [14,15]. Appropriate decision is based on an average patient's education as an ethical pathway. In literature, there are a large number of studies concerning the quality of life (QoL) after both treatments for iAAA (EVAR and OSR), suggesting that endovascular therapies possess an early advantage of patients' return to normal daily life and equality between both treatment modalities at the end of the first year [16-18]. Patients with iAAA should be informed about the pros

and cons of the treatment choices without bias. Improving the patient's knowledge, gaining consciousness of the situation, and realistic expectations about the treatment results should be essential. However, awareness depends on the sociocultural level of the country and is therefore changeable. In the current study, we tried to figure out the awareness of aneurysmal disease while evaluating it from the patient's perspective in our country.

The first part was determining the patient's knowledge and awareness about iAAA before the information. Most patients did not have any information about their disease before the information. Only a small group had searched for the disease on the internet; however, exploring the diseases or investigating from the net was ineffective in having consciousness about the disease. The patients with anxiety about having iAAA were more likely to have consciousness. Significantly, younger participants had more awareness and knowledge about the disease. These patients were also higher educated than those in primary school. Low educational levels and higher age indicated a deterministic approach and less awareness about the disease and type of treatments. We did not achieve a cut-off age value for the estimation due to the small patient cohort; however, the results also showed that information taken from the internet was not correlated to awareness or consciousness as there is a lot of misinformation with commercial purposes. The graduated patient group was much more aware and conscious. Gaining awareness and information about the disease were also related to age and education level.

Patient's perspective is another essential factor particularly. With the growing number of endovascular procedures, patients just tell their experiences to their relatives or friends. We are obligated to perform the best treatment for our patients and give the disease or treatment-specific information. According to the sociocultural level of the patient, there may be some expectations or priority requests. The less invasive nature of endovascular treatments is attractive. Despite being warned of the risks of EVAR due to their young age, four patients decided on EVAR over OSR. Low educational levels and higher age showed a deterministic approach and less awareness about the disease and type of treatments. 26% of patients were unaware even though they were informed by us, maybe the information was misinterpreted and may have changed more basically due to the patients.

Therefore, for each patient, the treatment choice must be carefully selected. However, the PREFER study showed that the attitude and preferences of the physician in charge influence the way information is given. This affects the patient's understanding and choices. Our country and patient profile are mostly compatible with the paternalistic model, in which the healthcare providers control the final decision. "Custom-made treatment modality" provided by cardiovascular surgeons, considering patients' priorities and decisions, seems to be the optimal approach.

Patients have different backgrounds and education levels.

Therefore, the information should be somehow customized individually. Depending upon our experience, we also perform mostly endovascular procedures. However, this is not opposed to the patient's choices, and we know that the patient will try another address, like interventional radiologists or cardiologists if we insist on another treatment modality, mostly open conventional surgery. However, we still perform $\geq 20\%$ of these patients' open traditional surgery. The only clinic that should provide the most appropriate treatment will be Cardiovascular Surgery Clinic, as we have the education and experience on every treatment modality. Soon after an endovascular procedure, experiencing a higher risk OSR with an endograft inside will not benefit anyone.

In our daily practice involving aneurysm patients, we encounter an increasing number of late conversions to open surgery of failed EVARs, and we think that the real numbers about this are more than we expected, as many patients were visiting our outpatient clinic with no surveillance control for years from external medical centers. Therefore, close surveillance of this patient cohort is another important mandatory issue.

CONCLUSION

We may conclude that the information given to patients is limited to or as much as the other persons' (patient) understanding. Informatory model for higher educated patients and paternalistic model for older aged and low educational leveled patients seem to be more compatible. The patients in our country obey what the doctor says over 90%. Therefore the most important point is the choice of the treatment individually for each patient, that mostly influenced by the health worker in charge and we recommend this health worker should be a Cardio-endovascular surgeon knowing and performing all choice of treatments.

Limitations

This study has some limitations; however, the results were very interesting. Therefore, we decided to report these initial results. The patient cohort is small, and all patients had EVAR at different times. There is no comparison with another treatment, especially open conventional surgery.

We may conclude that the information given to patients is limited to or as much as the other persons' (patient) understanding. The informatory model for higher educated patients and the paternalistic model for older and low educational level patients seems more compatible. The patients in our country obey what the doctor says over 90%. Therefore, the most crucial point is the choice of treatment individually for each patient, influenced mainly by the healthcare professionals in charge. Our opinion is that a cardio-endovascular specialist knowing and performing all treatments should be more suitable

Ethics Committee Approval: Ethical approval for this study was obtained from Hospital Clinical Research and Ethics Committee (15.12.2021/E1-21-2226).

Patient Consent for Publication: Informed consent was obtained from all patients.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

Author Contributions: All authors contributed equally to the article.

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