CARDIOLOGIE TUNISIENNE

ARTICLE ORIGINAL

Video-assisted nurse-led educational intervention for patients with coronary artery disease: a randomized trial

Education thérapeutique assistée par vidéo et assurée par des infirmiers aux patients coronariens : étude randomisée

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Summary

Introduction: Therapeutic patient education (TPE) is a cornerstone in coronary artery disease (CAD) secondary prevention. Currently, one-on-one education seems to be difficult in front of time and resources restrictions.

Objectives: Impact evaluation of video-based and nurse-led TPE in patients with CAD.

Methods: During 3 months, patients with acute coronary syndromes were randomly assigned in 3:1 ratio to "intervention group" (15-minute multidisciplinary educational video combined with individualized information sessions delivered by nurses) and to "control group" (conventional bedside TPE). Primary endpoint was knowledge self-assessment regarding CAD secondary prevention.

Results: 113 patients were included. There was a significant difference in self-assessed knowledge with respect to all targeted criteria: disease and revascularization techniques explanation (100% vs. 26.7%), healthy physical activity (97.6% vs.16.7%), dietary recommendations (96.4% vs. 16.7%), expected treatment effects (95.2% vs. 26.7%), treatment side effects (88% vs. 20%), treatment adherence (97.6% vs. 26.7%), diabetes management (97.4% vs. 30.8%), hypertension management (97.4% vs. 21.4%), tobacco cessation (98.6% vs. 44.4%) and dyslipidemia management (100% vs. 12.5%). Satisfaction regarding TPE sessions was expressed by 96.4% of patients.

Conclusions: Video-based and nurse-delivered TPE was associated with significantly improved CAD secondary prevention literacy when compared to conventional bedside education. A high satisfaction rate was noted among these innovative TPE sessions participants.

Keywords

Therapeutic education; secondary prevention; coronary artery disease; video; nurse.

Résumé

Introduction: L'éducation thérapeutique du patient (ETP) est un élément clé de la prévention secondaire de la maladie coronaire (MC). Actuellement, l'éducation individuelle semble difficile à mettre en place compte tenu des contraintes de temps et de ressources.

Objectifs : Évaluation de l'impact de l'ETP assistée par vidéo et assurée par les infirmiers chez les patients atteints de MC.

Méthodes : Durant 3 mois, les patients atteints de syndromes coronariens aigus ont été répartis aléatoirement, selon un ratio de 3:1, entre un « groupe d'intervention » (vidéo éducative multidisciplinaire de 15 minutes associée à des séances d'information individualisées dispensées par des infirmiers) et un « groupe témoin » (ETP conventionnelle au chevet du patient). Le critère d'évaluation principal était l'auto-évaluation des connaissances en matière de prévention secondaire de la MC.

Résultats : 113 patients inclus. Il y avait une différence significative dans les connaissances auto-évaluées par rapport à tous les critères ciblés : explication de la maladie et des techniques de revascularisation (100% vs 26,7%), activité physique saine (97,6% vs 16,7%), recommandations diététiques (96,4% vs 16,7%), effets attendus du traitement (95,2% vs 26,7%), effets secondaires du traitement (88% vs20 %), observance du traitement (97,6% vs 26,7%), gestion du diabète (97,4% vs 30,8%), gestion de l'hypertension (97,4% vs 21,4%), sevrage tabagique (98,6% vs 44,4%) et gestion de la dyslipidémie (100% vs 12,5%). 96,4 % des patients se sont déclarés satisfaits des séances d'ETP.

Conclusions : L'ETP assistée par vidéo et assurée par des infirmiers a été associée à une amélioration significative des connaissances en matière de prévention secondaire de la MC par rapport à l'éducation conventionnelle au chevet du patient. Un taux de satisfaction élevé a été constaté parmi les participants à ces séances innovantes de TPE.

Mots-clés

Education thérapeutique ; prévention secondaire ; maladie coronaire ; vidéo ; infirmier.

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INTRODUCTION

Coronary artery disease (CAD) is the leading cause of death in the world (16.6% of global mortality) according to the World Health Organization in 2016 [1]. If improved primary prevention, diagnosis and treatment in western countries decreased dramatically mortality from CAD in western countries, ischemic heart disease is of a growing concern in developing countries, where it poses a real public health challenge [2]. In the particular case of Tunisia, mortality from CAD accounted for 29.2% in 2016, nearly double the international rate [3].

One of highly recommended management strategies, therapeutic patient education (TPE) for secondary prevention of CAD has become a cornerstone to achieve improved health outcomes and prevent major cardiovascular events occurrence [2, 5-10]. Despite established benefit of TPE, the Tunisian national overview PREMISE II (Prevention of Recurrence of Myocardial Infarction and Stroke) cross-sectional multicenter study evaluating secondary prevention of CAD in university hospitals revealed persisting gaps, with respect to non-pharmacological measures especially, where prescription of healthy diet and smoking cessation have not exceeded 54% and 34.2% respectively [4].

With current shorter hospital stays after acute coronary events and limited human resources in acute care units, providing one-on-one counselling or teaching seems to be difficult nowadays. We aimed through this study to evaluate the impact of video-based educational intervention dedicated to patients with CAD combined with individualized information sessions delivered by nurses.

METHODS

Study Design and Population

This was a randomized trial conducted from March to June 2019.

Were included all patients hospitalized in intensive care unit for acute coronary syndrome with angiographically confirmed CAD.

Were not included patients over 80 years, patients with cognitive decline, patients with diagnosed heart failure and those with asymptomatic left ventricle ejection fraction <50%.

Enrolled patients were randomly assigned to "intervention group" which benefited from a video-assisted educational interactive session delivered by nurses or to "control group" receiving standard bedside education during hospital stay, with randomization ratio of 3:1, according to computer-generated list of random numbers.

The study was carried out according to Helsinki declaration principles and an informed consent was obtained in all patients.

Study intervention

Innovative 15 minutes video tool was designed for the purposes of this study. It was developed by a multidisciplinary team including two cardiologists, nephrologist, endocrinologist, nutritionist and two nurses. This video was based on educational interview with a standardized simulated-patient with several cardiovascular risk factors, who had just been hospitalized for acute coronary syndrome and underwent percutaneous coronary intervention during the index hospitalization. Main topics covered during educational audio-visual tool were: CAD pathogenesis and main revascularization strategies; expected therapeutic actions, side effects of prescribed drugs and potential risks of non-compliance to medical treatment; healthy recommended lifestyle (Mediterranean diet and regular physical activity) and management of modifiable cardiovascular risk factors (tobacco cessation, diabetes, arterial hypertension and dyslipidemia).

Educational session began with video projection. Following this projection, a team of 3 trained nurses discussed video content with patients and responded to specific questions asked by patients participating to the session.

For better nurse-patient communication, the maximum number of patients per one educational session was fixed to ten patients. The required timing for each session was fixed to 45-60 minutes.

Study endpoints

A questionnaire was designed and administrated to patients at the end of TPE session in intervention group and at discharge in control group. Study endpoint was patient's opinion assessment using Likert's psychometric scale (likert1932) with respect to 10 evaluated items (Table 1). A format of four rating categories was adopted (strongly disagree, disagree, agree and strongly agree) according to patient's appreciation of clarity and understanding of delivered information. A subsequent transformation of ordinal variables collected in 4 classes form in the questionnaire into binary variables by grouping unfavorable or negative responses ("strongly disagree" and "disagree") on one side and favorable or positive responses ("agree" and "strongly agree") on the other, was carried out for the purposes of statistical analysis.

Finally, overall patient's satisfaction regarding the video support projection and the hole educational session were evaluated among those assigned to intervention group.

Table 1. Questionnaire administrated to patients after therapeutic education session in the intervention group and at discharge in control group.

Did delivered therapeutic education permitted to you to understand:	Strongly disagree	Disagree	Agree	Strongly agree
1. coronary artery disease, principles and aims of percutaneous coronary interventions and coronary artery bypass graft				
2. expected therapeutic actions of prescribed drugs				
3. side effects of prescribed drugs				
4. potential risks of non-compliance to medical treatment				
5. recommended Mediterranean diet				
6. recommended physical activity				
7. benefits of smoking cessation				
8. how to manage arterial hypertension				
9. how to manage diabetes				
10. how to manage dyslipidaemia				

Data entry and statistical analysis

Data entry and analysis were performed using SPSS software version 22. Absolute and relative frequencies (percentages) were calculated for qualitative variables and means and standard deviations or medians and interquartile intervals were calculated for quantitative variables. Comparisons between qualitative independent variables (percentages) were made by Pearson chi-square test, or exact Fisher test in case of Pearson chi-square test invalidity. Comparisons between 2 independent quantitative variables (medians scores between intervention and control group), were performed using the Student independent t-test, or using the non-parametric Mann-Whitney test if the distribution's normality for the quantitative variable has not been verified (significant Shapiro-Wilk test, p-value <5%). In all statistical tests, the threshold of significance was set at 5%.

RESULTS

A total of 113 patients have been analyzed in this study. Participants' flow chart is detailed in figure 1.

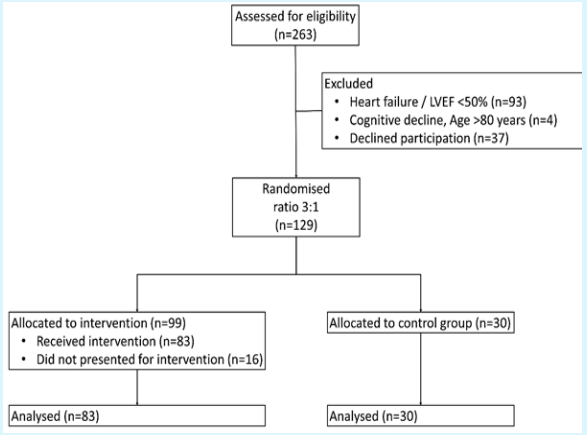

Figure 1. Study flow diagram

Baseline characteristics are summarized in table 2.

Table 2. Baseline characteristics.

	Total N=113		Control group N=30	P
Age (years)	59.1 ± 9.1	59.6 ± 8.9	57.6 ± 9.5	0,310
Men	78 (69.0%)	60 (72.3%)	18 (60.0%)	0,212
Socio-cultural level				
• Illiterate	25 (22.1%)	17 (20.5%)	8 (26.7%)	0,484
• Others				
• Primary	29 (25.7%)	20 (24.1%)	9 (30.0%)	-
• Secondary	45 (39.8%)	36 (43.4%)	9 (30.0%)	-
• University	15 (13.3%)	10 (12.0%)	5 (16.7%)	-
Socio-economic level				
• Unemployed	20 (17.7%)	12 (14.5%)	8 (26.7%)	0,133
• Others				
• Day labourer	15 (13.3%)	12 (14.5%)	3 (10.0%)	-
• Founctionary / liberal activity	21 (35%)	8 (27%)	13 (43%)	-
• Retirement	22 (37%)	14 (47%)	8 (27%)	-
Modifiable cardiovascular risk factors				
• Current or former smoker	69 (61.1%)	55 (66.3%)	14 (46.7%)	0.059
• Current smoker	40 (35.4%)	31 (37.3%)	9 (30.0%)	0,471
• Diabetes	52 (46.0%)	39 (47.0%)	13 (43.3%)	0,731
• Hypertension	52 (46.0%)	38 (45.8%)	14 (46.7%)	0,934
• Dyslipidemia	30 (26.5%)	22 (26.5%)	8 (26.7%)	0,986
≥ 2 modifiable cardiovascular risk factors				

As for cardiovascular risk factors, "intervention group" and "control group" were comparable (Table 2). A total of 97 patients (85.8%) had at least one potentially modifiable cardiovascular risk factor. Diabetes and arterial hypertension were the most common risk factors (46.0%) followed by current smoking (35.4%) and dyslipidemia (26.5%). A high-risk factor burden was noted in our study population with 55 patients (48.7%) cumulating two or more modifiable cardiovascular risk factors (45.8% vs. 56.7% in intervention and control groups respectively, p=0.307).

A potential confounding factors were educational and employment status of patients. Overall proportion of illiterates was 22.1% (20.5% vs. 26.7% in the intervention and control groups respectively, p=0.48) and unemployment was observed among 17.7% of patients (14.5% vs. 26.7% in the intervention and control groups respectively, p=0.13).

Median hospital stay was 3 days [2-5] and was comparable in both groups. During hospitalization, all patients received bedside education for secondary prevention of CAD delivered by medical doctors and nurses.

Results of questionnaire regarding secondary prevention of CAD are summarized in figures 2 and 3.

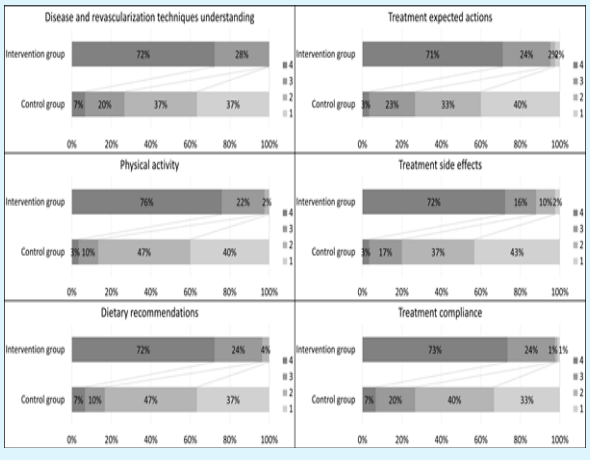

Figure 2. Patients' responses to questionnaire about level of information understanding in intervention and control groups according to Likert scale (1: strongly disagree; 2: disagree; 3: agree; 4: strongly agree). Subset of questions applicable for overall population.

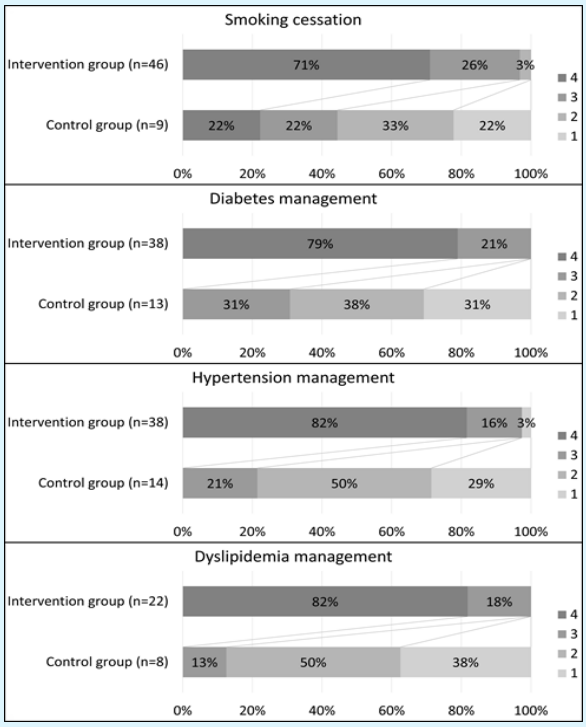

Figure 3. Patients' responses to questionnaire about level of information understanding in intervention and control groups according to Likert scale (1: strongly disagree; 2: disagree; 3: agree; 4: strongly agree). Subset of questions applicable only for patients with

After binary transformation of patients' responses as specified above, this study demonstrated significantly improved understanding with respect of all items targeted in the video support and during TPE sessions compared to control group (Table 3).

Table 3. Questionnaire results after binary transformation of patients' responses. Percentages are referring to positive answers combining "agree" and "strongly agree" responses regarding patients' self-assessment of understanding level of evaluated items.

	Intervention group	Control group	p
Disease and revascularization techniques explanation	100%	26.7%	<0.0001
Physical activity	97.6%	13.3%	<0.0001
Dietary recommendations	96.4%	16.7%	<0.0001
Diabetes management*	97.4%	30.8%	<0.0001
Hypertension management*	97.4%	21.4%	<0.0001
Tobacco cessation*	96.8%	44.4%	<0.0001
Dyslipidemia management*	100%	12.5%	<0.0001
Mean positive answers	96.6 ± 3.4%	23,9 ± 9.5%	<0.0001

*only patients with the specific risk factors were asked to respond to questions regarding these items.

Mean of positive answers (agree and strongly agree) among the 10 evaluated criteria were achieved in 96.6 ± 3.4% vs. 23.9 ± 9.5% in intervention and control groups respectively, p<0.0001.

Overall satisfaction regarding video-assisted and nurse-delivered TPE sessions was expressed by 96.4% of patients (25.3% were satisfied and 71.1% were very satisfied).

DISCUSSION

This randomized trial demonstrated efficacity of video-assisted and nurse-delivered TPE sessions for patients with CAD. Primary endpoint (positive answers to self-assessing questionnaire regarding 10 evaluated criteria) were achieved in 96.6 ± 3.4% vs. 23.9 ± 9.5% in intervention and control groups respectively, p<0.0001.

Despite conventional TPE at bedside during hospitalizations, a low-level of understanding of the 10 evaluated items of CAD secondary prevention (ranging from 12.5% to 44.4%) was noted in control group predicting poor behavior modifications with regard to cardiovascular risk factors and treatment adherence.

Effectiveness of specific TPE sessions after a coronary event was indeed established by larges studies both in terms of morbidity and mortality reduction [5–10]. For these purposes, international recommendations involved nurses and others health professionals in cardiovascular disease prevention [11–13] since interest of cardiovascular prevention programs conducted by nurses was established by several publications [14–17]. The RESPONSE trial compared the effect of usual care with a prevention intervention made up of outpatient care coordinated by nurse. At one year, patients in the intervention group had better control of risk factors, fewer readmissions and emergency room visits, and lower risk of mortality, estimated by the high-risk Systemic Risk Calculation Risk (SCORE) score which decreased by 17% compared to the control group [17].

In our study protocol, a video was designed as an innovative complementary tool to TPE sessions. Through this original method, we aimed to reach large audience and to deliver standardized and precise information for CAD secondary prevention provided by multidisciplinary team (cardiologist, nephrologist, endocrinologist, nutritionist and nurses) in in everyday language. Gathering this staff of experts would have been difficult on a regular basis to ensure sessions of TPE.

Among different possible conceptual types of video-based educational interventions (animated presentations, patient narratives…), our video format was a simulated-patient interview so that patients can easily identify themselves with the aim of better impact on their behavior response to TPE.

To the best of our knowledge, specific data regarding video-assisted TPE for secondary CAD prevention are scarcely reported in the literature [18–20]. In a systematic review of 28 controlled trials, positive impact of video was demonstrated for different therapeutic education goals (heart failure, treatment adherence, breast self-examination…) but this method was variably effective depending on targeted behaviors to be influenced (not effective for addiction behavior changing…) [21].

Study limitations: Main study limitation was the analyzed outcome. This was knowledge-based only through a self-evaluation questionnaire administrated immediately after TPE session for intervention group or at discharge for control group. A recent review paper of video-based educational interventions in inpatient settings including 62 studies concluded that 61% of them had a significant positive effect. In these studies, most prevalent used outcome was also knowledge-based demonstrating only improvement of short-term literacy and few study designs focused on clinical, emotional, and behavioural endpoints [22]. An extended follow-up duration of patients in our study should be scheduled for long-term behaviour changing and health impact demonstration.

CONCLUSION

In this study, a significant improvement of disease and healthy life style understanding, treatment actions, side effects and risks of non-adherence knowledge and cardiovascular risk factors management assimilation was achieved through multidisciplinary video-based educational intervention combined with individualized information sessions delivered by nurses, compared to conventional bedside therapeutic education for secondary prevention of CAD.

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