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Abdullah, Omar Riyadh ; Ignatowicz, Agnieszka; Mahdi, Rania A ; Young, Annie

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Review Article

Cancer Patients' Experiences and Understanding of Venous Thromboembolism

Omar R Abdullah^{1*}, Agnieszka Ignatowicz², Rania Abdulsalam Mahdi³, Annie M Young¹

¹ Warwick Medical School, University of Warwick, UK

² College of Medicine and dental sciences, university of Birmingham, UK

³ Ibn-Alatheer hospital, Mosul, Iraq

* corresponding to: omaroncologist@gmail.com

ABSTRACT

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Background: Venous thromboembolism (VTE), comprising deep vein thrombosis (DVT) and pulmonary embolism (PE), presents an extra challenge in the management of patients with cancer, given the increase in morbidity and mortality in having both conditions. Cancer patients are well known to have a high risk of VTE; particularly; those who have had major surgery, chemotherapy and/or hormonal therapy. These groups of patients need to understand the risk factors and the prophylactic measures to prevent developing VTE. This review aims to provide an overview of the literature on cancer patients' understanding of VTE and their experiences of cancer-associated thrombosis (CAT).

Method: A scoping review was carried map the literature and explore the types of evidence available. A structured electronic search was conducted in Embase, Scopus and Medline in June 2020. All titles and abstracts from the search were evaluated independently by two reviewers and disagreements were resolved by a third arbitrator. Eligible papers were qualitative studies and reviews of adult patients' experience of cancer-associated thrombosis.

Results: Ten articles met the inclusion criteria, nine primary qualitative studies and one systematic review that explored cancer patients' experiences of living with CAT. Participants had various cancer types. Most had advanced disease and were receiving palliative care. Four major themes emerged from the data: Lack of meaningful information on CAT, cancer patients unaware of signs and symptoms of VTE, limited awareness of CAT amongst HCPs and acceptability of anticoagulant.

Conclusion: All the studies explored patients' experience of VTE in the cancer context, and all included studies showed that participants had limited information about VTE, VTE risk and VTEs' signs and symptoms. However, no qualitative studies explored patients' understanding of VTE in prophylactic settings in high-risk cancer patients.

Introduction

Venous thromboembolism (VTE) is a serious health challenge in patients with cancer; however, its severity is perhaps undervalued by healthcare professionals (HCPs) and oncologists (1).

Cancer patients are generally unaware of CAT, thromboprophylaxis measures and consequences of CAT. Two recent cancer patient surveys on CAT in cancer patients found that less than half of patients were aware of the increased risk of developing VTE with a malignancy (2). The most up-to-date

American Society of Clinical Oncology (ASCO) guidelines demand a better education regarding VTE in cancer patients who are at high risk for VTE (3).

The prevention and treatment of VTE in cancer patients cannot be optimized without good awareness among patients. High-quality communication between HCPs and patients leads to a better CAT awareness in cancer patients. HCPs caring for cancer patients need to focus on educating patients on CAT, particularly in high risk settings such as major surgery and chemotherapy (3).

In current oncology practice, prevention and treatment of CAT are practiced according to international guidelines; the main challenge for healthcare providers is how to improve the awareness of cancer patients before CAT happens ultimately to strive to save lives (4).

Rationale for scoping review

Cancer patients are well known to have a high risk of VTE, in particular, those patients who have had major surgery, chemotherapy and/or hormonal therapy (1). These groups of patients need to understand the risk factors of CAT and the prophylactic measures to prevent developing VTE.

To stimulate improvements in the supportive care of cancer patients and decrease VTE risk, and increased understanding and awareness regarding CAT in cancer patients are required (5). A scoping review is a type of information synthesis that follows a systematic approach to map the literature on a subject and explore the types of evidence available, then determines gaps in that literature (6). This scoping review was conducted in an attempt to explore communication risk on VTE between cancer patients and health professionals before VTE diagnosis.

Aims and objectives

Aim:

-To explore the literature on patients' experiences and understanding of CAT in cancer patients.

Objectives:

- Highlight cancer patients' perspective on CAT
- Explore the content of the information on CAT communicated to cancer patient before CAT diagnosis
- Explore gaps in HCPs and cancer patient education regarding CAT.

Methods for Scoping Review

A structured electronic search was conducted across three databases, which included Embase, Scopus and Medline, in July 2021 (Appendix 1). The search strategies combined with terms relating to venous thromboembolism, cancer-associated thrombosis, deep vein thrombosis, pulmonary embolism, anticoagulants, thromboprophylaxis, Low Molecular-weight Heparin, cancer and qualitative study. The electronic searches were limited to English language. No date restrictions were imposed, to ensure all relevant available literature pertaining to qualitative studies on cancer patient's understanding of cancer-associated thrombosis (CAT) and their experience were identified. Bibliographies from relevant studies were examined for additional related studies.

Search inclusion and exclusion criteria for scoping review

Inclusion criteria:

- Studies of adult cancer patients with CAT
- Qualitative studies that explored the experience of cancer patients on VTE and related treatments

Exclusion criteria:

- Non-English language studies

Analysis of scoping review

The results of this scoping review are presented in a descriptive manner. Included studies were selected according to a primary focus of the research in which the principles of thematic analysis were used to explore cancer patients' understanding of VTE from their experience of having had cancer and related treatments.

All qualitative studies regarding CAT in cancer patients were used to explore findings and evidence that answered the research questions. The researcher identified themes for knowledge synthesis using thematic analysis. For coding, the papers were read and re-read in order to become familiar with the data and discover codes. Direct quotes from cancer patients and the researcher comments were used from each study for coding and then developing themes related to the aims of this scoping review. Two reviewers independently checked selected themes; discrepancies were resolved through discussion

Results of Scoping Review

Of the 329 publications, a total of ten met the inclusion criteria and were selected for this scoping review. All stages of the extraction process are shown in the PRISMA flow diagram (Figure1).

PRISMA Flow Diagram

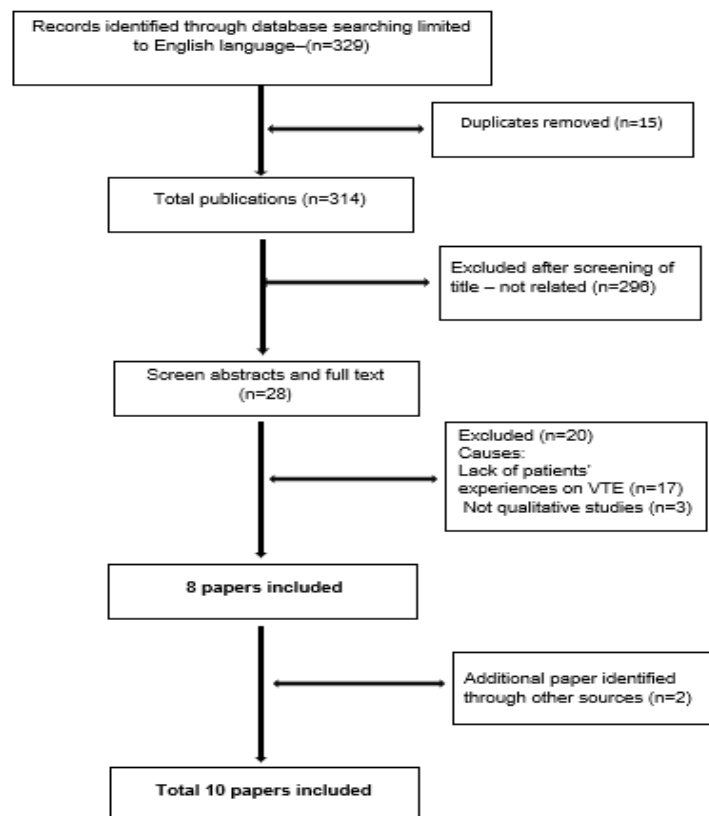


Figure 1: Study selection process of scoping review

All titles and abstracts from the search were evaluated independently by two reviewers (AI and RM) and disagreements were resolved by a third arbitrator (AY). In total, ten qualitative studies discussing thrombosis and anti-thrombotic treatment in cancer patients were found. However, no studies explored patients' understanding of VTE in prophylactic settings in high-risk cancer patients.

Papers included in this review addressed patients' experiences of CAT within the context of their cancer journey. A total of 152 cancer patients with VTE were contained within these studies. The participants represented a wide variety of cancer types and stages such as colorectal, breast, bladder, ovary, lung, renal, prostate and pancreas. All participants were adults of mixed gender, ranging from 32 to 84 years of age.

The number of participants in research-specific papers ranged from 8 to 40. Further characteristics of the eight papers reviewed as part of this scoping review are outlined in Table 1. Most studies originated in the UK. There was no published study before 2007; however, the majority of studies were published in the five years prior to this review being conducted (2015–2020). Of the articles recognized in this review, five discussed patients' experience of cancer-associated thrombosis and four were about anti-thrombotic treatments, such as low molecular weight heparin (LMWH) in cancer patients and its impact on their life. There are nine primary qualitative studies and one systematic review that explored cancer patients' experiences of living with VTE (Table 3):

Table 1.

Qualitative studies of cancer-associated thrombosis.

Study	Method	Setting	Aim	Analysis
(7)	Semi-structured Interview	UK	Assessing the appropriateness of LMWH in palliative care patients and extent of daily injection burden	Thematic analysis
(8)	Semi-structured Interview	Canada	Exploring the experiences of patients with cancer who developed VTE	Thematic analysis
(9)	Semi-structured Interview	UK	Exploring the acceptability of long-term LMWH for the treatment of CAT	Thematic analysis
(10)	Semi-structured Interview	UK	Exploring patients' experiences of CAT within the context of cancer journey	Framework analysis
(11)	Semi-structured Interview	UK	Impact of a dedicated CAT service on clinical outcomes	Thematic analysis
(5)	Systematic review	UK	Exploring patients' experience of CAT: an exploratory study	Thematic analysis
(12)	Semi-structured Interview	Spain	Exploring patients' experience of CAT within a Spanish setting.	Framework analysis
(13)	Semi-	Canda	Exploring patients'	Framework

Study	Method	Setting	Aim	Analysis
(14)	structured Interview Focus groups with clinicians; semi-structured interviews with patients and their relatives	UK	experience of CAT within a Canadian setting Explore clinicians' attitudes/patients' and relatives' experiences towards LMWH treatment for CAT versus cessation at 6 months in cancer patients; patients' perception of CAT and anticoagulation	Framework analysis
(15)	Semi-structured Interview	New Zealand	Exploring patients' experience of CAT within a New Zealand setting	Framework analysis

CAT - Cancer-associated thrombosis, VTE - Venous thromboembolism

Synthesis of Findings

The findings are presented as themes, as recognized from the included studies: these themes comprised: lack of meaningful information, cancer patients unaware of signs and symptoms of VTE and limited awareness of VTE amongst HCPs and acceptability of anti-coagulant:

Theme 1: Lack of meaningful information on CAT

Five studies explored patient information regarding VTE in cancer patients, known as cancer-associated thrombosis (CAT), in the context of patient's cancer journey (8, 10, 12, 13, 15).

It is well known that VTE risk is elevated in cancer patients, and is higher with cancer treatments (surgery, chemotherapy and long in-hospital admission). Although VTE may occur within the first few months of diagnosis of cancer, participants were often unaware of their high risk of developing VTE (8, 16).

In more than one study, cancer patients reported that they had minimal information or support regarding CAT. Patients with cancer were not well informed about VTE, risk factors or their risk of VTE: "Nobody really explained, [...] 'coz they need the bed, you know. So, you don't feel as though erm, you know, I think if it was a little bit more relaxed er, they probably would've got somebody you know, from a department to come and explain it more." [VCC05] (10).

"During my cancer treatments, I was never told that there was a risk of getting a blood clot. I didn't know about it... I was pretty shaken up" (8).

When patients do not have background knowledge about VTE, they may have strong feelings and emotion during VTE diagnosis. Effective communication thus puts patients at ease:

"I have never heard of venous thromboembolism, so that's why I was so shocked" (8).

Patients explained about the moment the doctors told them they had VTE. It was noticeable that cancer patients felt worried and suffered from significant distress due to a lack of forewarning regarding the risk of VTE and possibility of death (8, 10, 13). It is common for cancer patients to feel anxious about their health, about what investigations and treatments they might have to undergo and about what the future holds for them:

"The blood clot was a scary thing because I didn't know if I should have been looking for something and from what questions I have

been asked, there was nothing that would have alerted me. ... Because knowing nothing about clots, it just meant almost like a death sentence" [100-10] (13).

"[...] but they don't tell you you're gonna get clots after chemo, that's the one thing they haven't, they never said but we, we just put it down to, it's just my breathing [...] just that one item of information that we weren't aware of" [VCC07] (10).

Conversely, patients with the right information about VTE, before VTE diagnosis, answered in a calm manner and looked for medical help directly after their doctors told them they had VTE. Thus, effective communication between HCPs and their patients reduces patients' anxiety and build their confidence:

"I was out of breath and I said to my partner, 'I think we are going to the hospital, without panic because I knew that it was something that could be rectified effectively'" (8).

As mentioned before, patients are receptive to having more knowledge and they need to know the truth (12).

"There's nothing wrong with having a little more information." (LP03) (12).

"We told him that we wanted to know the truth, and in the clinic, I don't know whether they saw the attitude we had, but they have always told him the truth, always, because what I have, not knowing, doesn't solve anything. And in the clinic, they were very open right away." (LP18) (12).

In 2016, an evaluation of the development of a dedicated cancer-associated thrombosis (CAT) service was conducted: this revealed that some patients saw information leaflets as providing information and assurance (11):

"The knowledge you get by reading the, all the different literature makes it that much reassuring you know." (11).

In the UK, a mixed-methods study described the development of a dedicated CAT service and its evaluation, and reported that the amount and type of information given to cancer patients with thrombosis were enough for their required level of understanding (11):

"I think they told me what I could understand ... I don't need... graphic details and chemical things. As long as they tell me...they think that's what caused it. That's the treatment we're going to give you, and it should sort it out, and this is what you need to look out for in the future." (11).

One embedded qualitative study within a randomized controlled trial (RCT) to identify the most clinically effective and cost-effective length of anticoagulation in the treatment of cancer-associated thrombosis (ALICAT) discussed the participants' understanding of their risk of having more VTE if they were randomized to the control arm of the ALICAT RCT and stopped receiving anticoagulant drugs (LMWH) (14). ALICAT study revealed that participants with a history of VTE might have an understanding of their ongoing risk of developing VTE (14). Three participants in this trial believed that they still had ongoing cancer and that they remained at risk of developing another VTE:

"I thought well the cancer is still there, there's still a possibility that I would get the clot back." [interview NC2] (14)

Clearly, the dominant reason, found in the ALICAT study for refusing to cease anticoagulant treatment was that patients believed that they would experience another VTE (14).

Cancer patients are receptive to receiving more information about VTE, but do not need very detailed information (12).

"There's nothing wrong with having a little more information.' (LP03) (12).

Theme 2: Cancer patients unaware of signs and symptoms of VTE

In two studies, patients reported that they had no information about the signs and symptoms of VTE (8, 10). In Nobel et al.'s (2015) study, the patients stated that they were complaining about the delayed diagnosis of pulmonary embolism:

"They said it was probably pleurisy, gave me antibiotics [...] it was a pain I'd never had before" (10).

Two participants in Mockler et al.'s (2012) study suffered from sudden shortness of breath due to pulmonary embolism, but they diagnosed themselves wrongly with a heart attack:

"All of a sudden I couldn't breathe . . . I didn't know what was happening. . . . They wrote in the chart that it was a possible heart attack." (8).

"I felt I was having a heart attack . . . that stress made [the symptoms] worse." (8).

Informing cancer patients about CAT before developing VTE may support the patients for self-diagnosis and save their life. One of the patients in Mockler et al. (2012) mentioned that the awareness regarding VTE determines how the patient deal with symptoms of VTE and makes the patients to seek medical consultation:

"Prior knowledge of cancer-associated thrombosis risk and symptoms (or lack of knowledge) determined the patient's reaction to the symptoms of cancer-associated thrombosis" (8).

Benelhaj et al. (2018) in their systematic review also confirmed that cancer patients have little awareness of the signs and symptoms of VTE:

"Cancer patients are still not routinely educated about the risk or warning symptoms/signs of venous thromboembolism which may otherwise be misattributed to cancer by patient and clinician alike." (5)

Chemotherapy can cause unpleasant side effects, but it is difficult to predict what side effects patients would have. Cancer patients on chemotherapy usually have different side effects, making VTE very difficult to recognize. When VTE developed in patients who received chemotherapy, they therefore did not appreciate that their symptoms were due to VTE:

"[...] but um this time again first set of chemo, she felt terrible and the thing is, when we went back to hospital really desperate, the only problem we thought was that it was the chemotherapy that was causing it" [RG02] (10).

Increasing patients' awareness on VTE and related symptoms may increase patients' recognition of serious adverse effects and promote fast reporting.

Theme 3: Limited awareness of CAT amongst HCPs

Nobel et al. (2015) stated that in their study of patients' experiences of living with cancer-associated thrombosis (PLICAN

study), there was evidence of limited awareness of CAT and cancer among HCPs. Therefore, the limited knowledge regarding CAT in cancer patients was not restricted to patients (10). Moreover, the findings of the PELICAN study revealed that cancer patients reported delayed diagnosis of VTE, and on many occasions, alternative reasons or diagnosis were considered first:

“It just got bigger and bigger and bigger, over months really [...] then they doubled them (diuretics), and then they trebled them” [RG05] (10).

Regarding patients with shortness of breath associated with chest pain, these patients were often treated wrongly first with antibiotics for a supposed chest infection, which indicated doctors had limited information regarding VTE. One patient explained how his treating doctor reacted to his shortness of breath:

“I went to the doctor, and she listened and whatever and said it was probably pleurisy” [VCC12] (10).

Theme 4: Acceptability of anticoagulant

In patients with cancer, LMWH has been preferable for prophylactic and treatment of VTE. Most patients were commenced on LMWH, and others were on warfarin but changed to LMWH due to the uncontrolled the international normalized ratio (INR), absorption difficulties, and VTE recurrence:

“With the warfarin, what was kind of crappy was that I had to do blood tests every two weeks. But with Low Molecular Weight Heparin no need for draws.” (8).

Cancer patients have different views regarding the duration of using LMWH; some patients who experienced VTE desired to take LMWH for longer than 6 months as long as the risk of VTE was still present. Others, meanwhile, wanted to cease LMWH injection after 6 months due to the pain and side effects of the injections and wished to continue their normal life without injections:

“I was just happy to get off of it, to be honest with you, um it was more or less the same time every night, um and the pain as I said eh to me was terrible, horrific and a lot of bruising and things.” [Interview NC1] (14)

“And so, I was very keen I have to say, I was predisposed I don’t want any further injections once the treatments finished, I just want to try to get back to as much normality as I can.” [Interview NC8] (14).

For cancer patients with VTE, four studies estimated patients’ responses to anticoagulation treatments, concentrating on the acceptability and tolerability of receiving anti-clotting injections (7-9, 14). All studies explored the experience of cancer patients who have already had VTE, with LMWH, but there are no studies exploring cancer patients’ responses to use anticoagulants injection (LMWH) as a prophylactic measure. Anticoagulant had a good impact on patients’ life, especially for those who had experienced distressing symptoms. Generally, the patients agreed to use LMWH to treat VTE.

“I really don’t feel like pricking myself, but if it’s that or dying well, I’d rather prick myself.” (8).

“The needles—it’s painful, but you have to do it.” (8).

“It’s not a problem to inject myself; I’ll do that for as long as I have to.” [PT9] (9).

Cancer patients found LMWH to be an acceptable measure for treating VTE despite reporting a variety of symptoms associated with injecting.

Discussion of Scoping Review

This scoping review was conducted in order to map the key concepts supporting research regarding patients’ experiences and understanding of CAT and explore related studies and the types of evidence available, as this subject was not reviewed comprehensively before.

All the relevant literature was included regardless of study design. The findings of this review provide in-depth coverage of available qualitative studies regarding cancer patients’ experiences and understanding of VTE in order to explore the communication of VTE between cancer patients and HCPs before VTE diagnosis.

Four main themes, which were developed from the included articles, describe the type of knowledge regarding VTE possessed by cancer patients.

Lack of meaningful information on CAT:

Although only patients with cancer who had experienced a VTE were interviewed in the qualitative studies, they still had limited awareness of CAT or VTE and received limited education regarding their condition. Cancer patients did not have enough knowledge regarding VTE and the risks of developing VTE in their case before VTE was diagnosed.

Poorly framed information on cancer, risk of treatments and interventions in developing VTE in cancer patients may impact negatively on patients’ involvement in VTE prevention and receiving thromboprophylaxis measures (17). Moreover, a lack of awareness regarding the consequences and harms of VTE could lead to a misinterpretation of the prophylactic measures.

In Apenteng et al.’s (2016) qualitative study exploring patients’ perceptions and experiences of the prevention of hospital-acquired thrombosis, they found patient participation to be an essential aspect of the VTE prevention acquired during long in-hospital admission (17). Similarly, cancer patients play a prominent role in VTE prevention if they receive proper education regarding VTE. Cancer patients reported that a good understanding of their condition enhanced self-management, as well as improved access to support and information (11).

Improved communication regarding VTE and risk factors is likely to optimize the effectiveness of the prevention of VTE in cancer patients.

Cancer patients are not aware of signs and symptoms of VTE:

Benelhaj et al.’s (2018) study found that cancer patients were not usually educated about the signs/symptoms of VTE which may otherwise be misattributed to cancer (5).

Education regarding signs/symptoms of VTE for cancer patients may enable the patients to seek medical consultation and consequently lead to early diagnosis and saving their lives. Patients who received chemotherapy had difficulties in recognizing VTE from other side effects produced by chemotherapy (10). They need to be able to differentiate between signs/symptoms of VTE from other chemotherapy-related side effects. Medical oncologists during consenting patients for chemotherapy need to make more effort to educate patients about sign/symptoms of VTE. Patients should be

empowered with information on the signs and symptoms of VTE to enable them to recognize it as early as possible.

Limited awareness of VTE amongst HCPs: Knowledge should not be limited to cancer patients, but HCPs need to be well informed regarding VTE in cancer patients in order to have the ability for early diagnosis and provide useful information regarding VTE, risk factors and VTEs' signs/symptoms. Noble et al. (2015) in the PELICAN study discovered there that limited understanding of VTE amongst HCPs led to alternative diagnosis and delayed VTE diagnosis (10). It is very important to diagnose pulmonary embolism (PE) as early as possible due to its rapid and serious consequences (18). Hence, more attention is required for HCPs education, not only cancer patients. HCPs are the main source of information and they are considered as the senders of information. Thus, they should have good quality of information regarding VTE in order to diagnose VTE and educate their patients about VTE.

Acceptability of anticoagulant: Anticlotting injections are mainly used to treat or prevent VTE and its complications. All included qualitative studies explored patients' experiences of using anti-clotting injections as treating measures.

The attitudes of cancer patients with VTE about VTE treatment were useful, in that they helped the patients adhere to their anti-clotting treatment. They considered anticoagulant self-injections as necessary, although unpleasant (8).

It is clear that receiving anti-clotting injections is not pleasant, but patients with VTE feel it is mandatory. Anticlotting injections, like LMWH, were considered to be an acceptable intervention despite the need to receive the injections long-term (8, 9).

Some groups of high VTE risk cancer patients, such as those admitted to hospital or with major surgery, require anti-clotting injections. Their understanding of the role of anti-clotting injections (LMWH) makes them adhere more to the treatments. Hence, attitudes toward anticlotting measures and injections need to be explored in cancer patients who did not experience VTE but have a high risk of VTE and need anticlotting injections. Previous studies have established that increasing patient awareness of VTE increases treatment adherence (19). Communicating VTE to cancer patients in a clear and balanced way is required, as expert panels in ASCO recommend that cancer patients need periodic reminders about VTE risks, and HCPs should educate patients about VTE and related signs and symptoms (3).

VTE in cancer patients should be part of standard training and education for all HCPs caring for people with cancer. Physicians may use the results of this study to improve individual patient education.

Conclusion

In cancer patients who did not have VTE, there were no qualitative studies focusing on their understanding of VTE. All the studies explored patients' experience of VTE in the cancer context, and all included studies showed that participants had limited information about VTE, VTE risk and VTEs' signs and symptoms.

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