

PICOT Concept and Its Uses: Radiotherapy versus Surgery in Prostate Cancer

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Summary of PICOT Concept and Its Uses

There is a growing trend in the nursing research to adopt the evidence-based practice, which involves employing the best evidence in making clinical judgments and delivery of care. One of the formats used to help in sound, relevance, and effective gathering of evidence to address an issue of nursing practice concern is PICOT. The moniker PICOT is an acronym that stands for patient/population, intervention, compared intervention, outcome, and time. Organizing a research question in PICOT format ensure that the question is researchable. The format also helps in filtering the search limits by ensuring the identified PICOT properties are the main used in searching for appropriate articles from selected databases. The PICOT format also reduces cases of confounding variables and narrows the research question to addressing one focus (Riva, Malik, Burnie, Endicott & Busse, 2012).

The Question Source

During the nursing practice in the field, I noticed significance inflow of patient seeking prostate cancer therapy. The main options available for prostate cancer management for those at risk and those diagnosed with prostate cancer include radiotherapy and surgical therapy. These patients are slotted in for the different therapies from Monday to Friday, with therapy choice being based on resources available, Gleason Score, and PSA level. The witnessing these people come for therapy triggered my interest to evaluate the impact of radiotherapy or surgery on survival rates; which forms the focus of this paper.

Background of the Clinical Problem

Prostate cancer refers the abnormal cell regeneration in the prostate gland, which leads to tumor growth. The tumor causes the prostate gland to growth beyond its normal size

a scenario that may result in urethra blockage. The condition develops gradually, and may be asymptomatic in the early days. However, as the cancerous cells multiply, the patient may begin to experience symptoms and signs, whose severity depends on the severity of the tumor. The condition is diagnosed by examining the amount of prostate-specific antigen in the blood, transrectal ultrasound examination, and prostate biopsy. The main clinical presentation of prostate cancer includes difficult urinating, erectile dysfunction, reduced urine stream force, blood-stained urine or semen, unexplained discomfort in the pelvic region, and sometimes pelvic bone pain (American Cancer Society, 2015).

Prostate cancer is among the top two most common cancer types among men (Sooriakumaran, Nyberg, Akre, Haendler, Heus, Olsson et al., 2014). Prostate cancer accounted for 29% of all the cancer cases in America in the year 2012 (Merino, Francisco, Rojas, Bettoli, Zuniga & Besa, 2013). According to American Cancer Society (2015), roughly 27, 500 people (2% of the prostate cancer population) die out of prostate cancer, in America. The chances that a man will develop prostate cancer during a life span extending 80 years is about 14%, with the risk increasing passed age 60 years (American Cancer Society, 2015). The condition is very rare among people below age 40 years, and if present, it is likely to be asymptomatic (Merino, Francisco, Rojas, Bettoli, Zuniga & Besa, 2013).

One of the common risk factors for prostate cancer is old age. As a person grows, so does the prostate gland increase in size. Infections such as gonorrhea and chlamydia, and inflammation of the prostate gland (prostatitis) are other factors associated with etiology of prostatic cancer. Genetic inheritance or gene change especially the BRCA1, BRCA2, and hereditary non-polyposis colorectal cancer also have been shown to risk development of prostate cancer. Moreover, prostate cancer is believed to be geographically influenced since it is common in North America, Northwestern Europe, Australia, and Caribbean Islands. Other factors that may increase the risk of having prostate cancer include exposure to carcinogenic,

black race, a diet rich in red meat and animal products, and history of smoking (American Cancer Society, 2015).

Prostate cancer is managed using different approaches as a combination or singly. The choice of treatment depends on severity of the condition, available resources, and location of the tumor (American Cancer Society, 2015). The aim of treatment is to enhance the patient outcomes such as reducing mortality, correcting erectile dysfunction, addressing difficult in urinating, and alleviating other symptoms (American Cancer Society, 2015). One of the main treatment approaches is through prostatectomy, which is surgical removal of the affected prostate section before the cancer spreads. Radical prostatectomy is the most common surgical management of prostate cancer (Merino, Francisco, Rojas, Bettoli, Zuniga & Besa, 2013). Second management approach is radiotherapy, which may involve external beam radiotherapy or radioactive seed implants (Nepple, Stephenson, Kallogjeri, Michalski, Grubb, Strobe et al, 2013). There are also some drugs that can be used to shrink the size or delay the tumor cells multiplication by reducing the level of androgen hormones (correction (American Cancer Society, 2015). Some therapists may also prefer conservative methods in managing the condition. This paper is interested in the effectiveness of two main approaches, the radiotherapy and surgical.

The PICOT Question

The population of interest for this paper is males aged 50 years plus diagnosed with prostate cancer. The primary therapy being evaluated is radiotherapy, which is compared to surgical therapy. The outcome targeted is an improvement in survival rates while the time frame is spread across the duration following diagnosis. Therefore, the PICOT question that for this study reads “In men ages 50 years and above with a diagnosis of prostate cancer (P),

does radiotherapy (I) compared to surgery (C) influence the survival rates (O) of the patients for the duration following diagnosis (T)?"

Learning Expectation from PICOT Question

Survival after prostate cancer treatment is a major concern for those seeking prostate cancer therapies (Petrelli, Vavassori, Coinu, Borgonovo, Sarti & Barni, 2014). The health professionals offering care to those with prostate cancer consider the associated therapy survival rate as a critical issue to consider while choosing the appropriate therapy.

Radiotherapy and surgical therapy being the most common approaches to managing prostate cancer (Boorjian, Karnes, Viterbo, Rangel, Bergstraih, Horwitz et al., 2011) it is crucial to evaluate their associated survival rates. Such information will be essential in helping health professional make appropriate therapy choice, and make effective and justifiable explanation to the client on the choice of the therapy. The PICOT question is expected illuminate on the subject of the best therapy based on projected survival rate following either radiotherapy or surgical therapy in prostate cancer management.

Search Terms

The articles for locating the required evidence to answer the PICOT question were accessed from PubMed database. The main search terms used were lifted from the PICOT attributes. These search terms included prostate cancer, survival rates, radiotherapy, and prostatectomy. The retrieved 23 articles but five articles were selected on the basis of being full articles, recent (from 2011), targeting males 50 years old, credible, valid, and reliable.

Articles' Relevance to PICOT Question

Boorjian, Karnes, Viterbo, Rangel, Bergstraih, Horwitz et al., 2011, study evaluated data from 1847 patients treated with radical prostatectomy (1238 patients), external beam

radiotherapy (265 patients), and external beam radiotherapy with adjuvant – androgen-deprivation therapy (344). The aim of the study was to determine long-term survival rates of the patient following their therapy. The findings indicated that the survival rates in ten years' time for those underwent surgical therapy was 92%; for those who received radiotherapy alone was 88% while those who received radiotherapy and adjuvant was 92%. These findings led to the conclusion that surgery has a higher survival rates than radiotherapy, unless radiotherapy is combined with an adjuvant. This article is crucial since other than providing necessary evidence for answering the PICOT question, it also introduce the influence of adjuvant of survival rates.

Merino, Francisco, Rojas, Bettoli, Zuniga & Besa, 2013, conducted a cohort study evaluating the implications of intensity–modulated radiotherapy compared to radical prostatectomy. The targeted population in this study comprised of patient with localized prostate cancer. The implications evaluated were mainly three; overall survival, prostate cancer-specific survival, and biochemical failure-free survival. The study evaluated 1200 participants, where 993 patients were put on radical prostatectomy and 207 under when intensity-modulated radiotherapy. The retrospective cohort study evaluated for patient data in the prostate cancer patient registry for those who sort cancer therapy in the years 1999 through March 2010. The study concluded that patient who underwent radical prostatectomy witnessed had a better prognosis, better overall survival, but with no influence on disease-specific survival. This article is crucial in providing needed data for answering the PICOT question. The data leading to the article conclusion is sourced from a large sample size, which improves results reliability.

Nepple, Stephenson, Kallogjeri, Michalski, Grubb, Strobe et al., 2013, evaluated the prostate cancer mortality and overall mortality using a retrospective review of patient 6692 patients. The study collected for patient treated in a period stretching twelve years (1995-

2007). Out of the total patient population evaluated, 4459 patients received radical prostatectomy, 1261 patients received external-beam radiotherapy, and 972 patients received brachytherapy. The results indicated that both external beam radiation and brachytherapy were associated with increased prostate cancer and overall mortality rates compared to surgery. This article is in-line with the PICOT question since it evaluates both the intervention and the compared intervention highlighted in the PICOT question. Therefore, the article is essential for providing relevant data for answering the PICOT question. In addition, having several articles addressing similar issues will lay a good foundation for appraising evidence located in the different articles.

Sooriakumaran, Nyberg, Akre, Haendler, Heus, Olsson et al., 2014, also delved the topic on patient outcome following radiotherapy or radicle prostatectomy. The study was an observational study involving 21533 patients who received surgical correction, and 12982 patients. These patients' data was followed up for 15 years. The main outcomes measured were cumulative mortality incidence form prostate cancer, and cumulative mortality incidence for other conditions. These outcomes were evaluated in relation to prostate cancer risk level (low, intermediate, high, and metastatic), age, and Charlson comorbidity score. The results indicated a significance rise in mortality risk with increase in risk levels, and increase in age for both radiotherapy and surgical managed patients. Surgery was found to have a more significant improvement on survival rates for those with non-metastatic prostate cancer while radiotherapy proved more beneficial than surgery in metastasized prostate cancer. This article will be significance in reinforcing the aforementioned findings. In addition, the article brings in the aspect of metastasis of prostate cancer and its influence on effectiveness or selected management regime.

Petrelli, Vavassori, Coinu, Borgonovo, Sarti & Barni (2014) article presents a systematic and meta-analysis study aimed at comparing patient outcomes after either radical

prostatectomy or external beam radiation. Articles were located from five databases – SCOPUS, CENTRAL, EMBASE, MEDLINE, and Web of Science. The articles targeted for review were mainly randomized control studies and observational studies. The main outcomes evaluated included overall survival rates and prostate cancer specific mortality. The conclusion made following the review of data from the 17 articles was that radical prostatectomy improved overall survival rates and the rates of prostate cancer specific mortality. Therefore, surgical therapy, not radiotherapy, was associated with higher survival rates. This article will be crucial for providing the needed evidence to answer the PICOT question, and for appraising the other articles providing related evidence.

Levels of Evidence

Levels of evidence are crucial for producing the most valid, reliable, credible, and justifiable evidence in support an evidence-based practice (Burns, Rohrich & Chung, 2011). Mostly, researchers seeking to employ evidence-based practice should aim for the highest rated evidence level. The articles providing evidence for this PICOT question were rated using the Center for Evidence Base Medicine as identified in the article by Burns, Rohrich & Chung, 2011 as illustrated in Appendix I. The evidence levels for the articles used is as illustrated in Table I. High evidence from level two and one were used for enhanced results reliability.

Table I: Evidence Level for Articles Used

Article	Study Design	Evidence Level
Boorjian et al., 2011.	Cohort study	2B
Merino et al., 2013.	Cohort study	2B
Nepple et al., 2013.	Cohort study	2B
Sooriakumaran et al., 2014	Observational study	2C
Petrelli et al., 2014.	Systematic review and meta-analysis	1A

Generalizability to the PICOT Question Answer

The study used in providing evidence for this PICOT question used large sample size, which were representative enough. The studies were done in natural setting without modifying the study environment. The studies are from different geographical regions, yet they show consistency in findings. In addition, data analysis was done by a team with evidence of counter vetting the analyzed data. Therefore, the five articles used had undisputable reliability, validity, trustworthy, and credibility levels. Therefore, their study can be generalized.

Answer to PICOT Question

From the evidence presented in the five articles, radiotherapy for prostate cancer results in poor survival rates as compared to surgery. Therefore, for males 50 years and above radiotherapy rates low compared to surgery towards improving survival rates for prostate cancer patients.

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Appendix 1

Level	Type of evidence
1A	Systematic review (with homogeneity) of RCTs
1B	Individual RCT (with narrow confidence intervals)
1C	All or none study
2A	Systematic review (with homogeneity) of cohort studies
2B	Individual Cohort study (including low quality RCT, e.g. <80% follow-up)
2C	“Outcomes” research; Ecological studies
3A	Systematic review (with homogeneity) of case-control studies
3B	Individual Case-control study
4	Case series (and poor quality cohort and case-control study)
5	Expert opinion without explicit critical appraisal or based on physiology bench research or “first principles”

Adapted from Burns, Rohrich & Chung, 2011.