Zamzami et al, 2017;3(1):64–67.
https://doi.org/10.24911/IJMDC.1.3.5

ORIGINAL RESEARCH

Characteristic of advanced stage bladder cancer managed with radiotherapy

Zuhirman Zamzami[1]*, Riri Yuliasti[2], Desbi Juananda[3]

ABSTRACT

Background: Bladder cancer is characterized by painless, gross, and intermittent hematuria. Radiotherapy uses high radiation to destroy cancer cells. This study aimed to find characteristics of advanced stage bladder cancer managed with radiotherapy.

Methodology: We reviewed medical records of advanced stage bladder cancer patients with radiotherapy in Arifin Achmad Regional General Hospital, Pekanbaru, Riau Province, Indonesia on January 2011–December 2015.

Results: There were 70 cases of bladder cancers in which 46 (57%) cases were the advanced stage bladder cancer patients, 80% were men and 31 cases (67%) without lymph node metastasis. In histopathology findings, transitional cell carcinoma was the most (85%) common cases while the others were squamous cell carcinoma (11%) and adenocarcinoma (4%). Of all 46 advanced stage bladder cancer cases, 30 (65.2%) cases were given radiotherapy while 16 (34.8%) cases were without radiotherapy.

Conclusion: Bladder cancer is common after prostate cancer and most likely affects male elderly more than women elderly. Radiotherapy is effective against bladder cancer given that it is compatible with the stage of cancer.

Keywords: Bladder cancer, advanced stage, radiotherapy.

Introduction

Bladder cancer is a cancer that occurs in bladder tissue and is characterized by painless, gross, and intermittent hematuria [1,2]. The incidence rate of bladder cancer is 2% of all cancer cases and it is the second most of all cancers in urology, after prostate cancer [3]. The mortality rate of bladder cancer was about 15.80 in 2014 [4]. A study in Hasan Sadikin Hospital Bandung reported that during the 7 years there were 351 cases of bladder cancer and 253 cases (72%) were transitional cell carcinoma (TCC). The mean age was 60.8 years and the highest age was >60 years, men compared with women were in the ratio of 6:1 [5].

A study in Cipto Mangunkusumo Hospital and Dharmais Cancer Hospital found 340 cases of bladder cancer in the period January 1995–December 2004, an increase about 15% per year in both hospitals, with the average age of 54 years. TCC was the most common type (78.8%) and about 60% cases were diagnosed as advanced local and advanced stage [5]. In Soetomo Hospital Surabaya, during 5 years (2008–2012), there were 126 cases of average age of 60.6 years and the most common age was >60 years, with the comparison between men and women were 4, 2:1 [6].

Bladder cancers are often found as superficial tumor which has not yet metastasized, but malignant tumors have a high recurrence. The treatment of this cancer is decided by the stage of the tumor. A superficial tumor without any metastasis to lymph nodes or distant metastases is recommended to choose transurethral resection of the bladder tumor and followed by intravesical chemotherapy instillation, especially in T1 and T is stage or recurrent Ta stage. If there is still recurrence with this treatment, it is recommended to do radical cystectomy as long as there is no metastases [3,7].

Radiotherapy uses high radiation to destroy cancer cell. Radiation will affect cancer cells in the process of multiplication or the mitosis of cancer cell is interrupted. About 50%–60% of cancer patients need radiotherapy. Radiotherapy is a radical therapy, and also palliative therapy to reduce the pain caused by cancer and as the

Correspondence to: Zuhirman Zamzami
*Division of Urology, Department of Surgery, Medical Faculty, Riau University, Kota Pekanbaru, Indonesia.
Email: zuhirman.zamzami@yahoo.com
Full list of author information is available at the end of the article.
Received: 4 February 2018 | **Accepted:** 21 February 2018

adjuvant therapy to reduce the risk of recurrence. On every therapy, more cancer cells die and the tumour gets smaller. The dead cancer cells are destroyed, brought by the blood and excreted from body [3].

The damage to the normal cells is the side effect of radiation. Radiation has good effects on tissues having fast mitosis [3]. The dose of radiation is determined by the size, width, type, and the stage of tumor and also the response of the tumor to the radiotherapy. Things to be noticed are the side effects occurring during radiotherapy that can be handled, radiation given to patient should not be left in the body so that the patient is not radioactive, only the part of the body that is given radiation and normal cells exposed to the radiation will recover after several hours of exposure [3,8].

Radiotherapy is given for 4–6 weeks, a dose of 45–50 Gy can degrade the staging of tumor on radical cystectomy [9,10]. Radiotherapy does not increase the survival rate. Although the modern radiotherapy technique is still developing, it still needs research [11].

A study of the bladder cancer by Yuwinanda [12] in Arifin Achmad Regional General Hospital Riau Province Pekanbaru Indonesia showed that bladder cancer was the second most common (12 cases = 18.18%) of all malignancies in urology and the incidence of bladder cancer was about 41.67%. Because there is still no data about the treatment of advanced stage bladder cancer with radiotherapy in Arifin Achmad Regional General Hospital Riau Province, Pekanbaru, we were interested in doing a study of the treatment of advanced stage bladder cancer with radiotherapy in the same hospital of Indonesia.

Materials and Methods

This was a retrospective descriptive study using secondary data from the medical record of Arifin Achmad Regional General Hospital, Riau Province, Pekanbaru, Indonesia, from 2011 to 2015. The collected data included sex, age, stage, and radiotherapy. We used univariate analysis for the statistics.

Results

There were 70 bladder cancers in which four (57%) cases were the advanced stage ones including 40 (85%) cases that were TCC, 11% and 3% (4%) cases were adenocarcinoma.

From 46 advanced stage bladder cancer cases, the most common age was older than 60 years old, the youngest was 9 years old, and the oldest was 77 years old. According to sex data of 46 advanced stage bladder cancer cases, 80% were men and 20% were women (Table 1). Figure 1 shows 46 advanced stage bladder cancer patients and 31 cases (67%) without lymph node metastasis. The other metastasized to one regional lymph node in four cases (9%) and 11 (24%) cases metastasized to another organ.

Figure 2 shows that according to histopathology classification, TCC was the most common case with 39 (85%) cases. Others were squamous cell carcinoma (11%) and adenocarcinoma (4%).

Figure 3 shows that of all 46 advanced stage bladder cancer cases, 30 (65.2%) cases had been given radiotherapy while 16 (34.8%) cases were without radiotherapy.

Discussion

An advanced stage bladder cancer is formed in the bladder tissue characterized by painless and intermittent hematuria. In this study, the advanced bladder cancer cases were 46 and consisted of 39 (85%) cases of TCC. Bladder cancer is caused by a change of cells in the bladder. However, bladder cancer is often related to smoking, parasitic infections, exposure to chemicals and radiation, such as the exposure of carcinogenic amino aromatic compounds with 2-naphthamine, benzidine, 3,3-dichlorobenzidine, and 4-aminobiphenyl content commonly found in the dyeing industry, cigarette smoke containing 2-(alpha and beta) naphthylamine and 4-aminobiphenyl, chronic infection by schistosoma haematobium and chronic inflammatory processes due to stone [3].

Thirty-nine (85%) cases of advanced stage bladder cancer were a type of TCC that is a malignant epithelial

Table1. *Characteristic distribution of advanced stage bladder cancer according to age and sex.*

Variables	Mean	SD	95% CI
Age	56.89	13.433	52.90
Sex:			
Men	0.8	0.4	1.08
Women	0.2		

CI, confidence interval; SD, standard deviation.

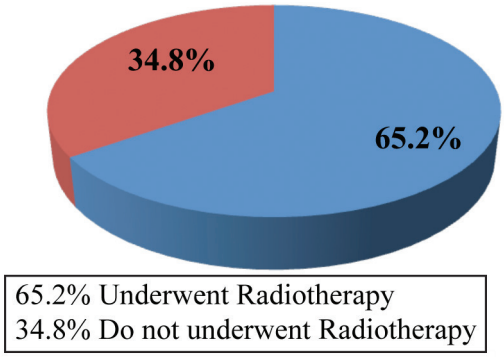

Figure 1. *Distribution of advanced stage bladder cancer patients.*

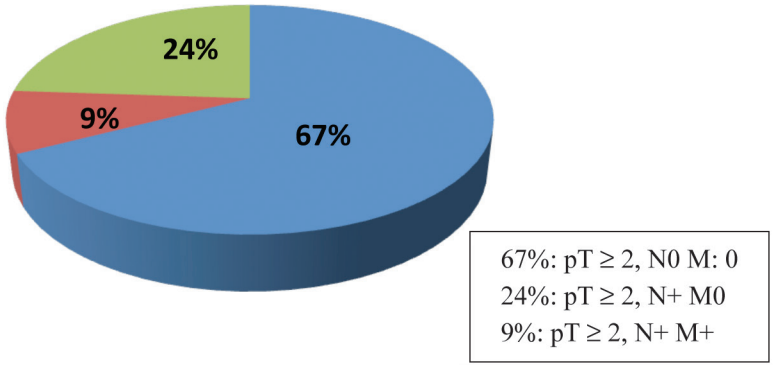

Figure 2. *Classification according to histopathology.*

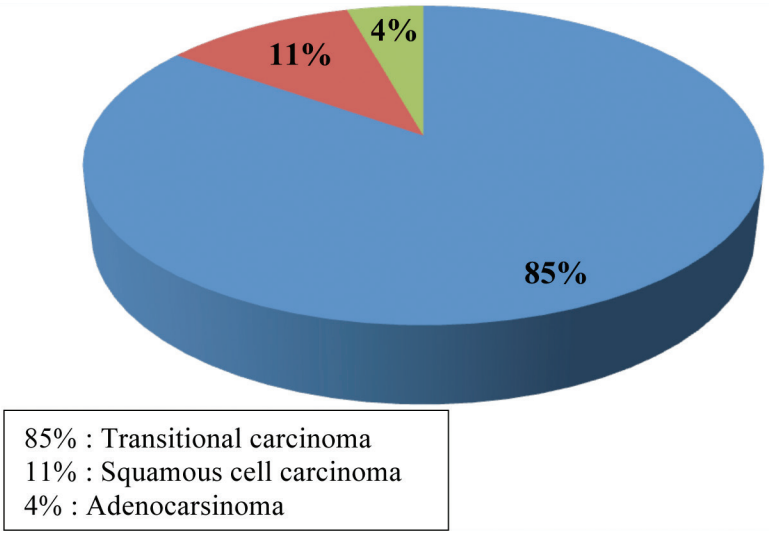

Figure 3. *Characteristic distribution of advanced stage bladder cancer according to radiotherapy.*

neoplasm in the urothelium with transitional cell differentiation. This malignancy is usually papillary and may originate from urinary bladder, ureter, or renal pelvis. Furthermore, advanced bladder cancer with five cases (11%) was squamous cell carcinoma and two (4%) were adenocarcinoma [3].

This study was the same as the one conducted by Umbas, in Cipto Mangunkusumo Hospital and Dharmis Cancer Hospital Jakarta, Indonesia. The study showed that most bladder cancer patients were TCC in 340 cases (78.8%) [5]. A study in New York (2014) showed that bladder cancer patients consisted of 95% of TCC, 3% squamous cell carcinoma, 2% adenocarcinoma [13]. Gree Dalton Grossfeld's Chicago study (2014) stated that bladder cancer patients consisted of 90% TCC, 5%–10% squamous cell carcinoma, and 2% adenocarcinoma [14].

Age is the risk factor for bladder cancer, which is correlated to age more than 60 years. In this study of all 46 advanced stage bladder cancer cases, the most common age was more than 60 years old, and the youngest was 9 years old and the eldest was 77 years old. According to sex data of all 46 advanced stage bladder cancer cases, mostly (80%) were men.

A study done by Yuwinanda [12] in Arifin Achmad Hospital Riau Province explained that advanced stage bladder cancer is the second most common malignancy case in urology, and TCC was the most common and affected in patients, especially in age more than 60 years old and in men more than women. Another study carried out in Cipto Mangunkusumo Hospital also showed that the mean age of the bladder cancer is more than 60 years old and in men more than women [5]. Another study in Soetomo Hospital during 5 years (2008–2012) also explained the mean of age of advanced stage bladder cancer was 60.6 years old and the highest is 60.6 years old and the comparison ratio of men is bigger than women [6]. A study in New York (2014) said that 60–70 years old is the most common age, and in comparison, men are affected more than women [12]. A study by Gree Dalton Grossfeld in Chicago (2014) also explained that advanced stage bladder cancer patients are mostly in the

age greater than 70 years and the comparison ratio is 86.4%:13.6% in men and women, respectively [14].

The result of the study done in Arifin Achmad Regional General Hospital Riau Province during 2011–2015 found that advanced stage bladder carcinoma patients were 46 patients. In 31 cases, tumor had invaded ½ external superficial muscle and not yet metastasized to other organs, 11 cases had metastasis to one regional lymph node multiple.

Advanced stage bladder carcinoma patient treated with radiotherapy with the dose 5,000–7,000 cGy during the period of given 5–8 weeks has a role and alternative therapy with a 5-year survival rate of 30%–45%. Radiotherapy aims to destroy tumor cells with the radiation given compatible to the stage of the tumor. Radiotherapy will destroy cancer cells so the multiplication process or the mitosis of cancer cell will be affected. About 50%–60% of cancer patients need radiotherapy [3]. In this study, the treatment of advanced stage bladder cancer with radiotherapy was 30 cases (65.2%) of all 46 cases, while 16 cases (34.8%) were without radiotherapy treatment for unknown reasons.

Conclusions

Bladder cancer is common after prostate cancer and most likely affects elderly men than elderly women. Radiotherapy is effective against bladder cancer given that it is compatible with the stage of cancer.

Acknowledgement
None

List of Abbreviation
TCC Transitional cell carcinoma

Funding
None

Conflict of Interests
None

Ethical approval
Approval on the study was obtained from the Ethical Review Board for Medicine and Health Research, Medical Faculty, University of Riau.

Authors' contribution
Z. Z. conceived, designed and did statistical analysis & editing of manuscript.
Z. Z., R. Y. did data collection and manuscript writing.
Z. Z., R. Y., and D. J. did review and final approval of manuscript.

Author details
Zuhirman Zamzami[1], Riri Yuliasti[2], Desbi Juananda[3]
1. Division of Urology, Department of Surgery, Medical Faculty, Riau University, Kota Pekanbaru, Indonesia
2. Department of Radiotherapy, Faculty of Medicine, Riau University, Kota Pekanbaru, Indonesia
3. Department of Anatomy, Faculty of Medicine, Riau University, Kota Pekanbaru, Indonesia

Consent for publication
Informed consent was obtained from the patients.

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