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Assessment of prostate cancer treatment efficacy keeping in view the morbidity of patients

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Abstract
This study was conducted in Punjab Institute of Nuclear Medicine (PINUM) and the data included 100 patients. All the patients have been undergone following pathological test as PSA test, biopsy and bone scan. Bone scan was done in all the patients to check bone metastasis that showed significant mortality in metastatic patients. In the case of smokers and non-smokers groups, smoking caused more death (P<0.01) whereas less patients died in non- smokers group (P>0.05).Keeping in view the socioeconomic status that depicted poor prognosis in lower middle class (P<0.05).Considerable mortality observed without any surgery (P<0.05). Mortality has been significantly observed in patients that was not exposed to radiation (P<0.05). Less hormonal treatment effect observed in patients that have been treated (P>0.05) and after chemotherapy has been observed no difference between mortality and survival rate. The data revealed that no significant improvement has been observed in patients after all the treatment and mostly due to the advanced stage of prostate cancer and poor socioeconomic status.

Keywords: Prostate cancer, assessment, efficacy, treatments,

Introduction

Prostate cancer is very prevalent cancer after skin and its treatment can be done effectively. In prostate cancer cell growth occurs without programmed and spread into the gland and can be spread outside the gland. It is diagnosed by prostate cancer specific test (PSA) and also determined by rectal exam [3]. Significant mortality due to prostate cancer has been determined in metastasis bone cancer especially in those patients with skeleton relevant events as compare to the Patients without metastasis. For prostate cancer radiotherapy, radical prostatectomy and androgen therapy that is so called androgen deprivation is available especially effective for non-metastatic patients that have initial stages [29]. The socioeconomic status is important impact on mortality because it lead to less treatment taking due to financial problem and caused progressive stages of cancer [6]. The patients with bone metastasis have been shown with high risk of mortality due to progressive stage. In bone metastasis patients 47% and 3% death observed [26]. The radiotherapy caused no impact in patients with invasive cancer but showed significant improvement with less morbid and localized cancer patients [2]**.** The radical prostatectomy reduced the cancer specific mortality in cancer patients but results were effective in localized cancer rather advanced stages and in patients with age ≥65 years [1]. Androgen deprivation therapy (ADT) is a type of hormonal treatment, important in prostate cancer patients but the application has not shown improvement in patients with invasive cancer even in patients with less serious stages [15]. The hormonal treatment has risks of prevalence of disease in patients that had adjuvant therapy. But overall it was effective in progressive cancer patients [22]. The smoker patients has high risk of prostate cancer specific mortality when compare with non-smoker [12]. When patients diagnosed with prostate cancer showed high risk of death due to cardiovascular diseases and other cancer specific mortalities [17]. The chemotherapy revealed limited improvement in prostate cancer patients but showed success in patients with advanced stages [34]. Radiation therapy required continues treatment interval for the prostate cancer cell destruction. The treatment needs constant observation of the patients and after the treatment the patients have skin abrasions [30]. The prostate cancer recurrence is common and it need specific models to detect the patients with high risk of mortality after therapies. The pathological tests can determine the risk factor of cancer mortality and morbidity for the patients [9]. The surgery has only effect on early stages of cancer and the result revealed the survival rates upto 99% while the early stages of cancer only detect using the pathological test as PSA test [13]. Surrogate end point was three months for the treatment by surgery and radiotherapy to lower the prostate specific end point. The early androgen deprivation therapy is important to lessen the chance of metastasis [7]. No proper treatment suggestion has been observed to lower treatment failure or lower their side effects. The only suggestion has been taken was to early metastatic patients were to undergo systemic treatments while patients that are non-metastatic can be used to examination methods or trial treatment methods [37]. After the surgery there is high risk of cancer recurrence in patients if their PSA level is more than 10 mg/l [27]. After the radiotherapy there was increase in PSA level in patients leading to metastatic stages and due to the last stages of cancer the hormonal therapy remained unaffected [33]. The patient after with PSA level < 1 mg/l has higher chance of survival and treatment effects while PSA level > 1 mg/l has risk of mortality with less treatments effects [4]. The patients only with localized prostate resulted in effective control by regular treatments [35]. With less morbid condition and localized prostate cancer patients that has undergone radiotherapy showed better treatment effect [20]. Hormonal treatment and radiotherapy was effective in patient with localized prostate cancer and with lower morbidity [8]. After 5

years of follow up patients with earlier stages of prostate cancer showed efficient treatments results [18]. No effective treatment of brachytherapy outcome was observed in patients in 5 years follow up in early, intermediate and last stages of prostate cancer due to high PSA level before the treatment [23]. The brachytherapy (radiotherapy) was effective for only those prostate cancer patients that was non-metastatic or has localized cancer [31]. The localized prostate cancer patients showed long term survival after the treatment with radiotherapy and surgery [36]. The hormonal treatment after radiotherapy better the survival rate in prostate cancer patients rather than alone radiotherapy in relatively lesser metastatic patients [25]. The brachytherapy along with elective radiation was effective in locally metastasized cancer patients [10]. The radiation dose was effective in localized prostate cancer and patients with no evidence of disease [14]. The patients with PSA level < or = 10 mg/l are effective with radiotherapy [28]. Hormonal therapy after surgery lower PSA level in patients and provided long term survival rates in patients [11]. Alone radiotherapy was not as such effective than patients of prostate cancer has radiotherapy along with hormonal treatment [19]. After long follow up of hormonal treatment the data revealed effective result in patients with relatively less advanced cancer [5]. The smoking caused mortality in prostate cancer patients and also have poor prognosis [24]. Prostate cancer patients treated with abiraterone acetate and prednisone showed better survival rates [32]. Docetaxel and octreotide combination decreased the risk of mortality in prostate cancer patients [16].The Docetaxel is effective in patients with hormonal resistant patients [38]. The metastatic cancer causes pain in bones and also other organs and mostly treatments are palliative that reduce patients morbidity [21].

Material and Method

The present study was conducted in Punjab Institute of Nuclear Medicine (PINUM). The diagnosis in these patients were done through two diagnostic test as PSA (prostate cancer specific antigen) test and biopsy test. In the institute radiotherapy, hormonal treatment, chemotherapy and surgery are provided to the patients for their recovery. Following categories have been evaluated in this study:

- Age
- Socioeconomic status
- Diagnostic test (biopsy and PSA test)
- History of treatments as hormonal treatment, Chemotherapy, radiotherapy and surgery
- Smoking status

Data sheet

Name ----------
Age ----------
Occupation/profession ----------
Socioeconomic status ----------
Smoking status ----------
Diagnostic test : Done /not done

- **Treatments**

Chemotherapy : Done /not done
Radiotherapy : Done /not done
Hormonal treatment : Done /not done
Surgery : Done /not done

Results and Discussion

The decision for treatment application is most important step for patients of prostate cancer. In this study patients have been treated by conventional treatments as radiotherapy, surgery, hormonal therapy and chemotherapy as easily available in Pakistan. Most of the patients were at advanced stages as 78.3% died significantly. But survival was significantly observed in patients (71.4%) without bone metastasis [37, 29, 26]. All the patients underwent surgery that is radical prostatectomy and significant mortality observed in patients without surgery but after surgery mortality and survival rate was not substantial. So, only surgery is also not best offer for treatment [1, 13, 36]. Patients also reached other treatments after surgery as some patients exposed to radiotherapy for better result but the consequences were not noteworthy as only 53% patients died while mortality was highly detected in patients that has not been exposed at all and also the progressive stages were also important factor for less survival [19, 23, 31, 20, 36, 30]. Out of the 30 patients some got hormonal treatment as androgen depressant medicine doses were given to the patients but this also has not remained effective for the patients when their history has been taken after some period by physicians [8, 18, 25]. The chemotherapy was still a choice for prostate cancer patients when all the other treatments action became unworthy but at the end this therapy also have no such impact to call it a best option for patients after the rejection of other treatments as 57.9% patients demised [35, 38]. The study suggested that all the treatments result went fail due to advanced stage of cancer in almost patients [29]. Also the socioeconomic status is important issue as significant patients (89.5%) were lower middle class [6] and smoking was also prevalent in patients and high mortality (84.2%) observed in smoker groups [12].

Table 1: Different treatments effects on mortality of prostate cancer patients

Treatments With/without	Patients die %	Patients survive%	Chi-square
Surgery			
Without surgery	81.8	18.2	χ^2=4.45 P<0.05
With Surgery	57.9	42.1	χ^2=0.47 P>0.05
Radiotherapy			
Without radiotherapy	84.6	15.4	χ^2=6.23 P<0.05
With Radiotherapy	53	47	χ^2=0.05 P>0.05
Hormonal Therapy			
Without hormonal therapy	87.5	12.5	χ^2=4.5 P<0.05
With hormonal therapy	59	41	χ^2=0.73 P>0.05
Chemotherapy			
Without chemotherapy	81.8	18.2	χ^2=4.45 P<0.05
With Chemotherapy	57.9	42.1	χ^2=0.47 P>0.05

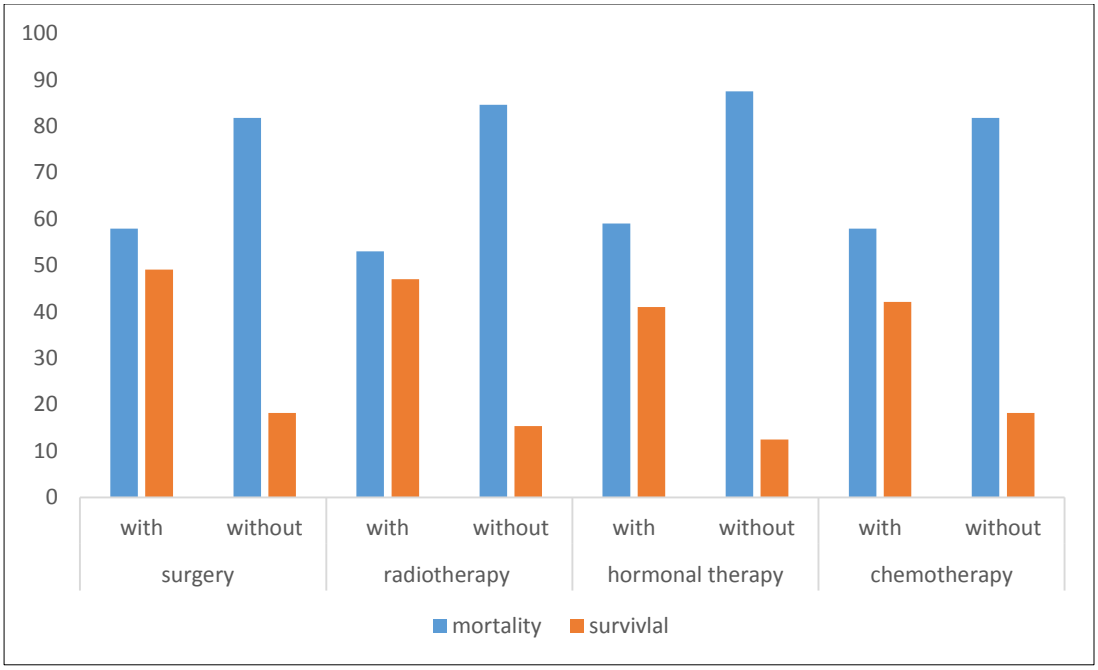

Fig 1. Mortality graph of all patients after the treatment

Table 2: Percentage mortality and survival in prostate cancer patients of different groups of bone metastasis, smoking and socioeconomic groups

Percentage mortalities			
	Mortality	**Survival**	
Bone Metastasis			
Present	78.3	21.7	χ^2=7.34 *P*<0.01
Absent	28.6	71.4	χ^2=1.28 *P*>0.05
Smoking			
Smoker	84.2	15.8	χ^2=8.89 *P*<0.01
Non-smokers	36.4	63.6	χ^2=0.82 *P*>0.05
Socioeconomic status			
Upper middle class	27.3	72.7	χ^2=2.27 *P*>0.05
Lower middle class	89.5	10.5	χ^2=11.84 *P*<0.05

Conclusion

The study showed any treatment has no effective result against prostate cancer. The treatment efficacy is not better because most of the patients were with progressive cancer and belonged to lower middle class and could not afford proper treatment. So, therapy would be successful if given at initial stages.

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