

## **Trends of opioid consumption for cancer patients during the last week of their life in a tertiary care center**

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### **Abstract**

**Background:** Pain is considered one of the most distressing symptoms for patients, the inadequate pain management remains a public health problem. **Aims:** The goal of this study was to describe the doses of opioids administered in the last week of life for adult cancer patients and to examine its associated factors. **Methods:** This is a retrospective cross-sectional study. Opioids administration and demographic data were extracted from clinical records of 64 stage four cancer patients admitted and died in Palliative Care Department at King Abdulaziz Medical City (KAMC) in Riyadh for one year. Opioids orders on day -7 and day -1 before death were reviewed (day 0 is the day of death). **Results:** Of 64 patients, 46 received opioids of different types. The average dose equivalent to PO morphine on day -7 was 49.14mg and on day -1 was 39.37mg. IV morphine was the most prescribed opioid on day -7 (28 patients) and on day -1 (33 patients). 33 out of the 64 patients received other analgesics. **Conclusions:** Our results suggest that Opioids for end stage cancer patients are under prescribed at KAMC in comparison to the USA.

**Keywords:** Cancer pain, opioids, palliative care, end of life

### **Key points:**

- Pain control is one of the major issues in the care of end-life cancer patients.
- Opioids is the major pharmaceutical method to control pain.
- End-stage cancer patients' charts were studied at their last week of life.
- The results suggest that opioids, in Saudi Arabia, are under-prescribed compared to USA in the same population.

## **INTRODUCTION**

Pain is defined as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage (Bonica 1979). Most pain resolves promptly once the stimulus is removed and the body damage is healed, however, sometimes pain persists despite absence of the stimulus and

apparent healing of the body; occasionally pain arises without any detectable stimulus, damage or disease (Kreitler and Beltrutti 2007). For that reason, The World Health Organization (WHO) acknowledges the burden of pain as a major health problem and established guidelines on how to assess and manage pain (World Health Organisation 1996).

Pain is one of the most distressing symptoms for patients especially cancer patients at late stage of their disease. Pain relief can be the utmost concern for terminally ill patients and their caregivers. Pain control is evident to improve quality and quantity of life while increasing chances of survival (Schiessl and others 2008, Neal 2012).

Different classes of medication are used in the management of pain; like Paracetamol, NSAIDs, and Opioids. Opioids are the strongest pharmacological remedies used for pain management, because of their direct action on mu receptors located in the Central Nervous System (CNS) (Hanks and others 2011). Therefore, it is considered the fundamental medication for pain management and the drug of choice in hospices and palliative care units (Bailey and others 2012). Although opioids prescription is standardized in hospices but some studies reported that opioids are under-prescribed in hospitals. Research demonstrated lower quality of life associated with inadequate pain management (Bengochea and others 2010, Neal 2012).

The Palliative care approach improves the quality of life of those patients who are terminally ill and their families alike and it begins at the moment of diagnosis of cancer and continues to follow up patients during the remaining days of patient's life to assure good quality of life. They are focused on treating symptoms including pain, nausea, breathlessness, insomnia, and other physical symptoms (National Cancer Institute 2010, WHO 2015, Caring for the Symptoms of Cancer and its Treatment 2016).

In a retrospective study reported by Bailey FA et al, data about end of life care of 1068 deceased was collected from patients' records. Results showed that 867 (82%) patients had pain noted in their end of life care charts. Out of 867 patients, only 686 (64%) patients had an active order of opioids at the time of their death. Furthermore, it was found that 85% of the opioids orders were for intravenous use (Bengochea and others 2010). In another retrospective cohort study conducted in Spain, on 1470 deceased patient in hospital at home units that is generally defined as the community-based provision of services usually associated with acute inpatient care (Leff 2009), they found that 41% had taken Opioids.

In a metaanalysis study, the consumption of opioids in the Middle-East was studied and compared to a global consumption level, it was found that Opioids consumption in the Middle-East increased 3.5 times more over the last twenty years (Silbermann 2011). Despite the scarce availability of morphine, it was found that 90% of morphine worldwide is consumed only by ten richest countries in the world (Austria, Canada, USA, Denmark, Australia, New Zealand, France, Iceland, Swaziland, and Norway). However, it is reported that morphine consumption increased moderately in the Kingdom of Saudi Arabia (KSA) compared to the marked increase in those ten richest countries (Silbermann 2011). Also similar results are reported by other studies show consistent result when the trend of consumption in the Middle East is compared to global trend.

This study was conducted to review the opioid consumption by cancer patients at the end of life treated by palliative care team at King Abdulaziz Medical City (KAMC) in Riyadh. Two main reasons were taken into account, first, to assess the institute's consumption in comparison with the developed countries. Secondly, to encourage health care workers in KAMC and all over the country to prescribe more opioid when required; should the results support the hypothesis that the opioids are under prescribed in KSA for palliative care patients.

**Subjects and methods:**

This article reports on a retrospective cross-sectional study that was carried out at the Palliative Care Department at KAMC in Riyadh. The sample included all cancer patients who were treated and died under palliative care to assess the type and dosage of opioids used at day -7 and day -1 before death, from 1-Jan-2014 to 1-Jan-2015.

**Study settings and subjects:**

The study was performed at King Abdulaziz Medical City (KAMC), Riyadh, Saudi Arabia. It was conducted in palliative care department. All adult patients more than 18-year-old with cancer under palliative care were included. However, adult patients who died before completing a week in the facility, or those ones with their cancer diagnosis was not clearly documented or had died under the care of another specialty were excluded.

**Study design and sampling:**

It is a retrospective cross-sectional study; the design was selected for the sake of convenience in acquiring data. Convenience sampling was determined to be used. Data was collected from charts during twelve consecutive months from 1-january-2014 to 1-january-2015. Total of 64 patients who met the criteria were included.

**Data collection method:**

Data collection sheet was designed to abstract information about demographics, date of admission and death, type of intervention, type of opioid, its dose transferred to the equivalent of oral morphine and if any other medication was used. The data was acquired through KAMC computer system (QCPPR). Missing information was acquired from patient's charts. To transfer different types of opioids doses to equivalent to oral morphine, equations were acquired from NCCN clinical practice guidelines in oncology (NCCN Guidelines®). Adult cancer pain version 2.2014 (Rurup ML and others, 2010).

**Data management and analysis:**

Data were entered into excel sheet. Then it was cleaned and reviewed for missing information. Data was then checked and transferred to SPSS for analysis. The data was divided into categorical and continuous. In accordance with the research objectives, the mean daily dose of day -7 and day -1 oral morphine equivalent was calculated, types of opioids used in the facility, usage of other analgesics. Medical ethical approval was not necessary for this study.

## RESULTS

The study included 64 patients fulfilled the inclusion criteria. All included patients were admitted with different types of cancer. The average age at admission was 61.5 years (standard deviation [SD], 12.9 years) [table1]. The average length of stay as an in-patient was 32.9 days (standard deviation [SD], 41.9 days) [table1]. The sample was predominantly male (60.9%). 65.6% of cancer patients had comorbidities [table2].

**Table 1.** Age and length of stay

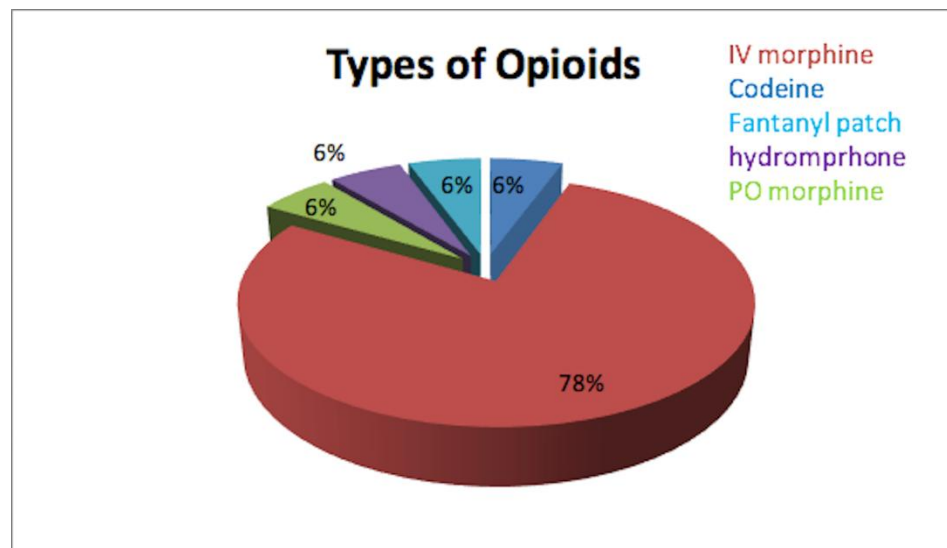
Variable	Mean	SD	Minimum	Maximum
Age	61.5	12.9	31	87
Length of stay in days	32.9	41.9	7	280

*SD; Standard deviation*

Most of the patients 46 (71.9%) received at least one prescription of opioids in the last week of life (table2). The most-prescribed opioid was IV morphine which was given to 76% of the patients, then codeine (6%) fentanyl patch (6%) hydromorphone (6%) and oral morphine (6%) [figure1]. The average dose of opioid equivalent to oral morphine was 49.14mg on day -7 and 39.37mg on day -1. Just more than half of the patients received other analgesics (51.6%) [table2].

**Table 2.** Descriptive data of the participants

Variable	Categories	n	%
Gender	Female	25	39.1
	Male	39	60.9
Comorbidities	Yes	42	65.6
	No	22	34.4
Opioid administration	Yes	46	71.9
	No	18	28.1
Other analgesics	Yes	33	51.6
	No	31	48.4



**Figure1.** Types of opioids

The proportion of patients for whom opioids were prescribed decreased sharply with increasing age at admission. For those younger than age 60 years, almost two-thirds (60%) were prescribed at least one opioid in the last week of life; however, for those older than age 80 years, the proportion was reduced to less than one-third (30%).

## **DISCUSSION**

This study found that 69.8% of palliative care department patients in KAMC had an active order of opioids as analgesia in their last week of life which was approximately two-third of the sample. When compared to others in developed countries, it was found that opioid orders presented were almost the same proportion (Cleary and others 2013).

Studies on opioids consumption trends showed a tendency to increase the dose as the patient's case develops to improve pain control. Thorns and sykes, published at 2000, stated that the daily mean increased from 44. to 55.5 mg/day, the median was 15 to 26.4 mg/day, over the last week of life which goes parallel with most of the studies available on the subject (Sykes and Thorns 2003). However, Schiessl C and others (2008) reported the change in days in percentages, they found only 5.6% of days increased their dose while 89.2% remained stable (Schiessl and others 2008). When comparing results of this study to other related studies, there is an evident different pattern where the mean dose is actually decreased. On day -7, the mean dose was 49.14mg/day while on day -1, it was 39.37mg/day. This can be explained by lack of experience of some of the doctors and nurses who tend to decrease the dose of opioids when the blood pressure or respiratory rate start to drop during the last week of life as part of natural end of life changes or due to decrease level of consciousness of most of the patients during this stage. Other cultural factors including pressure comes from family members or relatives not to over sedate the patient. The most common drug used was IV morphine with 67% of the sample which is consistent with other studies. This is probably because it is the gold standard opioid and most of the physicians are familiar with (Sykes and Thorns 2003, Schiessl and others 2008, Silbermann 2011).

The international databases on opioids consumption was checked, such as Wisconsin university database. In KSA, for the general population, the opioids consumption per citizen in 2013 was 0.78 mg/capita. However, when compared with developed countries figures, the difference is huge as the consumption per capita in the USA is 79.89 mg in 2013. Also, in Germany at the same year, it is 15.33 mg/capita. So in end-stage cancer patients, the average dose of opioids before death in USA and Canada was 192 with a range in between studies from 52-652 mg/day (Rurup and others 2010). However, in this study, the average was 44.25 mg/day which is far below the average in developed countries. This could be explained by many reasons, first Saudi Arabia like many other countries in the Middle East still under prescribing opioids when compared to developed countries due to many restrictions on opioid prescription (Cleary and others 2013). Second the model of care here is different and many doctors have concerns about complications and side effects of opioids with fear of legislation and strict regulation (Isbister and Bonifant 2001). Cultural factors are also an important barrier, including the patients and families concern and fear of addiction, side effects and other drug related misbeliefs.

The study focused on the last week of end-stage cancer patients whom hospital course and management may be different. In addition, the small sample size is another limitation. So inferences from this study need to be taken with caution.

## CONCLUSION

Overall, this study focused on opioids trends of consumption in KAMC as a tertiary care center in KSA. Results can infer that at KAMC opioids are under-prescribed compared to USA. Further research is needed on causes of under-prescription of opioids, and the need of local specialized doctors to develop and train on certain subjects of end-stage cancer patients pain control.

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### Contributors

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