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Original Research Article

Opioid Use in an Israeli Health Maintenance Organization: 2000–2006

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ABSTRACT

Objective. The objective of this study was to assess opioid use during 7 years (2000–2006) among Clalit Health Services (CHS) members.

Design. Purchasing data of opioids authorized for use in Israel were obtained from the computerized databases of CHS. Patient demographics and cancer morbidity were also extracted. The data were analyzed by converting the purchased opioids to oral morphine equivalents (OMEs).

Setting. CHS is the largest health maintenance organization in Israel (3,774,600) and insures almost 54% of the Israeli population.

Patients. All CHS members who purchased an opioid at least once during the 7-year study period (2000–2006).

Intervention. There were no interventions in this study.

Outcome Measures. The ourcome measures of this study were total OME purchased per year, OME (mg) per capita/per year, and OME (mg) daily dose.

Results. There were 119,562 patients who purchased an opioid at least once (3.2% of CHS population). Of them, 57.4% were women, 69.0% aged 65 years and above (average age 56.05 years ± 26.7), 7.7% purchased opioids for more than 12 months, and 81.3% purchased opioids for only 1–4 months. A 96% increase in total OME purchased was found between 2000 and 2006 (from 56.4 kg to 110.6 kg). The annual OME purchased per capita increased from 15.7 mg in the year 2000 to 29.3 mg in 2006. The total number of patients who received at least one opioid prescription increased by 60%, while the growth in total number of CHS members was smaller (4.8%).

Conclusions. There is a growing use of opioids at CHS during the 7-year period, a potential indicator of the progress made in improving accessibility and availability of opioids in our health care organization in Israel.

Key Words. Opioids; Pain Relief; Chronic Pain; Consumption; Cancer Pain; Non-Cancer Pain

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Introduction

Chronic pain is a common problem and is known to affect general health [1], psychological health [2–4], and social and economic well-being [5,6].

Appropriate management of pain decreases pain levels, may improve quality of life and function, and decreases health services utilization and cost of work absenteeism [7]. Opioids are considered a cornerstone in the treatment of cancer and non-cancer pain. Although opioids have been used for pain for over a millennia, only in the past decade has their efficacy for acute and chronic pain been confirmed [8].

The World Health Organization (WHO) considers a country s morphine consumption to be an important indicator of progress toward improving pain relief [9]. There is little or no use of opioids in nearly half of the countries in the world. The world consumption of morphine for medical purposes has been low and stable for many years before 1984, when the WHO cancer pain relief program began. From 1984 to 1991, the global consumption of morphine increased by 272%. In 1991, 57% of all morphine was consumed by 10 countries that have ranked highest in per capita consumption for a number of years. These are the developed countries: Australia, Canada, Denmark, Iceland, Ireland, New Zealand, Norway, Sweden, the United Kingdom, and the United States. Together, the top 20 countries (all developed countries) account for 86% of the morphine consumed in the world. The remaining 14% of morphine was consumed in approximately 100 other countries that consist of the majority of the world s population. In Israel, total morphine consumption grew from 2 kg in 1984 to 20 kg in 1991, a 900% increase [10].

A study at the Rambam Medical Center in Haifa, Israel, depicted opioid consumption during the years 1990–1999. During that decade, the overall opioid consumed in the hospital increased from 3.7 mg of oral morphine equivalent (OME) per inpatient day to 7.3 mg, and from 56 mg per surgical procedure to 100 mg. In 1990, injected opioids accounted for 93% of the overall consumption, whereas in 1999, they account for only 44% [11].

This study s objective was to assess the change in outpatient opioid use during 7 years (2000–2006) among all Clalit Health Services (CHS) members in Israel.

Methods

Study Population

CHS is the largest health maintenance organization (HMO) in Israel (3,774,600), insuring almost 54% of the Israeli population. CHS members are dispersed all over Israel in all different forms of residences (rural, urban). The study population included all CHS members who purchased an opioid at least once during the 7-year study period (2000–2006). According to the regulations in Israel, every physician is allowed to prescribe opioids for a 1-month period with no dose limitation. If prescribed for a month, each prescription must include the reason why the opioids were prescribed. Cancer patients receive opioids free of charge.

Data Sources

The data included all opioid formulations authorized and available for use in Israel, including: fentanyl (transdermal, ampules), buprenorphine (tablets), methadone (solution), morphine (tablets immediate/controlled release, ampules), oxycodone (tablets immediate/controlled release, syrup), and hydromorphone (ampules). Meperidine was excluded from the analysis as it is not designated to treat chronic pain, and is usually used in hospitalized patients and was purchased rarely.

The data included all opioids administered at primary care clinics, outpatient clinics, community pharmacies, emergency rooms, and home care units. The data did not include opioids administered during hospitalizations. Opioid purchase data were obtained from CHS pharmacy s computerized databases. In addition, patient demographics (gender, age, address and country of birth) and cancer diagnoses (excluding benign skin tumors) were also extracted.

Data Analysis

Morphine is the prototype and gold standard of comparison for opioid analgesics [12]. In order to compare opioids, we analyzed the data by converting all opioids purchased to OMEs [13].

Data analysis was performed in the SPSS version 15.0 software (SPSS Inc., Chicago, IL).

Baseline demographic variables were compared between patients with cancer pain and patients with non-cancer pain. For continuous variables, mean values, standard deviations, and *t*-test were used, and for categorical variables, chi-square test was used. *P* values less than 0.05 were considered statistically significant, with a power of 0.8.

Table 1 Sociodemographic characteristics of opioid purchasing populations during the years 2000–2006

	Patients with Cancer Pain		Patients with Non-Cancer Pain		Total		
	N	%	N	%	N	%	*P* value
Gender							
Male	16,450	45.4%	34,495	41.4%	50,945	42.6%	
Female	19,820	54.6%	48,797	58.6%	68,617	57.4%	<0.0001
Total	36,270		83,292		119,562		
Age (years)							
0–20	4,938	13.6%	13,220	15.9%	18,158	15.2%	
21–50	3,117	8.6%	15,795	19.0%	18,912	15.8%	
51+	28,215	77.8%	54,277	65.2%	82,492	69.0%	<0.0001
Total	36,270		83,292		119,562		
Average ± Std	59.98 ± 25.82		54.342 ± 26.96		56.05 ± 26.74		
Range	1–104		0–113		0–113		
Months of opioids purchasing							
1–4	25,236	69.6%	71,926	86.4%	97,162	81.3%	
5–11	6,981	19.2%	6,233	7.5%	13,214	11.1%	
12+	4,053	11.2%	5,134	6.2%	9,187	7.7%	<0.0001
Total	36,270		83,293		119,563		
Average ± Std	5.64 ± 9.61		3.69 ± 8.58		4.29 ± 8.95		
Range	1–84		1–84		1–84		

Std = standard deviation.

Definitions

1. Total OMEs (mg): the total annual amount of opioids purchased converted to OMEs.
2. Total prescriptions: the total annual amount of opioid prescriptions.
3. Prescriptions per patient: the total annual amount of opioid prescriptions divided by the total number of prescribed patients.
4. OME (mg) per patient: the total annual amount of opioids purchased converted to OMEs divided by the total number of prescribed patients.
5. OME (mg) per capita: the total annual amount of opioids purchased converted to OMEs divided by the total number of persons insured at CHS in the same calendar year.
6. OME (mg) daily dose: the total amount of opioids per prescription divided by the number of days for which it was prescribed.
7. Cancer pain patients: patients who received at least one opioid prescription and have been diagnosed with cancer (excluding benign skin cancer).

Results

During the study period, 119,562 CHS members purchased an opioid at least once (3.2% of CHS population). Among these members, 57.4% were women, 69.0% were aged 65 years or older (average age 56.1 years ± 26.7), 7.7% purchased an opioid for more than 12 months, and 81.3% purchased an opioid for only 1–4 months. No significant age and gender differences were found among patients purchasing opioids. Of the patients who purchased opioids, 29.5% suffered from cancer pain. Cancer pain patients were, on average, older compared with non-cancer pain patients (60.0 years ± 25.8 vs 54.3 years ± 30.0, $P < 0.0001$), and purchased opioids more often over a 12-month period (11.2%) compared with 6.2% of the non-cancer patients (Table 1).

Trends in Opioid Purchasing

A 96% increase in total annual OME (mg) purchased was observed from 2000 to 2006 (from 56.4 kg to 110.6 kg). During the study period, the total number of CHS members increased by 4.8% (from 3,597,066 in 2000 to 3,774,600 in 2006).

The total number of cancer pain patients who received at least one opioid prescription increased from 4,952 patients in 2000 to 9,008 patients in 2006 (82% increase). The number of non-cancer pain patients who received at least one opioid prescription increased from 13,599 in 2000 to 20,694 in 2006 (52% increase).

The total number of patients who received opioid prescriptions increased by 60% (from 18,551 to 29,632) while the increase in total CHS members in those years was significantly lower (almost 5%).

Figure 1 shows the amount of opioids purchased converted to OME (mg)/CHS capita per year and per generic medication type. In 2000,

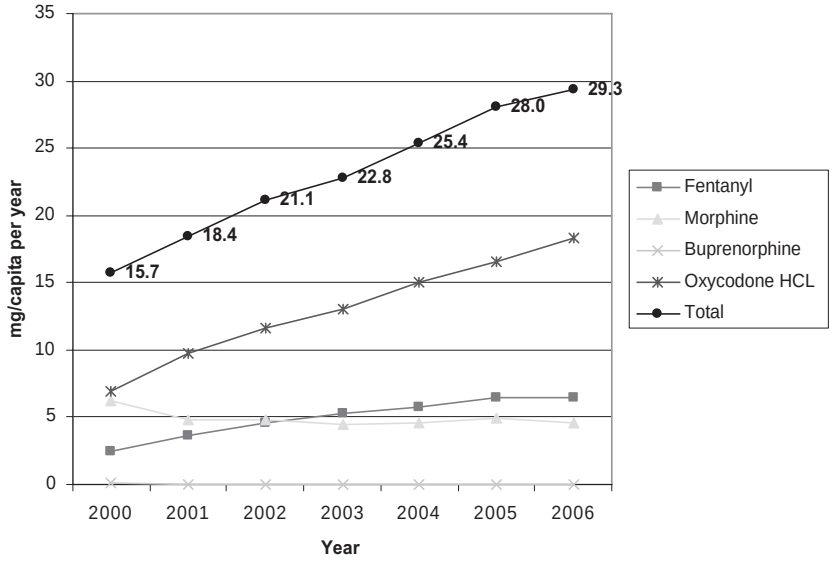


Figure 1 Opioids purchased converted to oral morphine equivalents (mg)/CHS capita per year and generic medication type. HCL = hydrochloride.

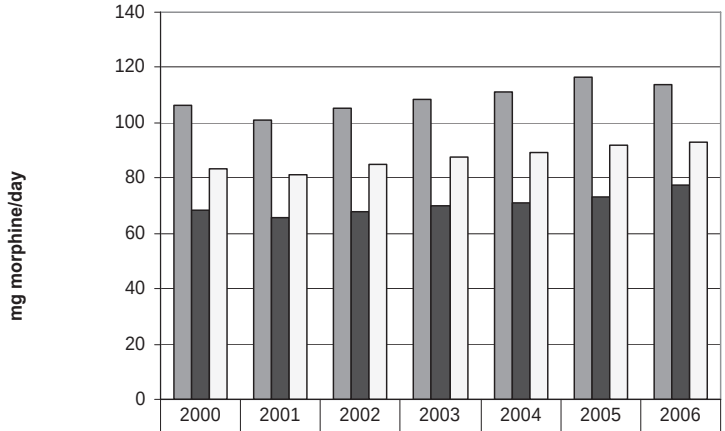
the total OME purchased per capita was 15.7 mg; this increased to 29.3 mg in 2006. Buprenorphine purchasing remained low and stable during these years. A decrease was found in morphine purchasing from 6.2 mg/capita in 2000 to 4.6 mg/capita in 2006. A significant increase was found in the purchasing of fentanyl (from 2.5 mg/capita [OME] in 2000 to 6.4 mg/capita [OME] in 2006) and in the purchasing of oxycodone hydrochloride (from 6.9 mg/capita [OME] to 18.3 mg/capita [OME] in 2006).

Cancer pain patients received on average more opioid prescriptions per patient compared with non-cancer pain patients (5.6 vs 3.4 in the year 2006). From the total number of patients in CHS diagnosed with cancer in 2006, only 6.2% received at least one opioid prescription (compared with 9.2% in the year 2000).

OME daily dose increased from 83.4 mg/day in 2000 to 92.8 mg/day in 2006. Patients with cancer pain received a higher daily dose (46–59% more) of OME (mg) per day compared with non-cancer pain patients (Figure 2).

Discussion

This study evaluates the 7-year trends in opioid purchasing among Israel CHS members. The study is unique regarding the scope of the study population (CHS insures 54% of the Israeli popu-



	2000	2001	2002	2003	2004	2005	2006
Patient with cancer pain	106.1	101.2	105.1	108.7	111.1	116.3	113.8
Patient with non-cancer pain	68.5	65.7	68.0	70.1	71.1	73.2	77.7
Total	83.4	81.0	85.0	87.6	89.3	92.2	92.9

Figure 2 Annual amount of opioids purchased converted to oral morphine equivalents (mg/day) per patient (cancer/non-cancer, total).

lation) and follow-up duration (7 years). Only a few studies with a similar scope have been published in the literature. Our data indicate an increase in opioid prescriptions for cancer and non-cancer pain with an annual increase in OME per capita (from 15.7 mg in 2000 to 29.3 mg in 2006). During the whole study period, there were no changes in regulations and policy. All opioids included were available in the market, and no major change in CHS population was observed during the whole study period. Our study included all opioids administered at outpatient settings (primary care clinics, outpatient clinics, community pharmacies, emergency rooms, and home care units). A study that described opioid prescriptions by US primary care physicians from 1992 to 2001 found an increase in the prevalence of visits where an opioid was prescribed from 41 per 1,000 visits in 1992–1993 to a peak of 63 per 1,000 in 1998–1999 ($P < 0.0001$ for trend), and then stabilized (59 per 1,000 in 2000–2001) [14].

In a Danish study, the change in opioid use from 1994 to 1998 in a cohort of cancer patients (24,190) in Funen County was analyzed. The overall consumption of opioids increased from 20 kg to 37 kg OME per year. The average annual consumption per user increased from 7.6 mg to 10.7 mg OME. The annual proportion of cancer patients who received at least one opioid prescription within the period of observation increased from 17% to 20% [15].

In our study, when examining only cancer pain patients, we found a higher increase in total opioid purchasing for the period, from 28.5 kg to 56.9 kg (99% increase). The number of cancer patients that purchased at least one opioid prescription increased from 4,952 in 2000 to 9,008 in 2006, although the number of prescriptions per cancer patient remained approximately the same (5.41 in 2000, 5.55 in 2006). However, only 6.2–9.2% of the cancer patients received an opioid prescription during the study period. This would mean that there are more cancer patients, but the pain is not necessarily being treated better.

In another study published recently [16], only 2–3% of the cancer patients receiving treatment with curative intent received opioids, despite the fact that 41% of the patients with curative treatment ≥6 months ago and 43% of the patients with curative treatment <6 months ago rated their pain as severe. Only 7% of the cancer patients with pain receiving palliative anticancer treatment received opioids.

In an Australian study, a dramatic increase in opioid prescribing was found during the years 1986–1996 (from 177 kg to 578 kg). A substantial proportion of consumption was for non-cancer pain. In a sample of patients being treated for non-cancer pain, long-term use and dose escalation occurred in one third of cases [17]. Another study described a population of chronic non-cancer pain patients discharged from a Danish multidisciplinary pain center with a 10-year follow-up. Opioid dose escalation occurred in few opioid users. Increase and decrease in opioid dosing were almost equally frequent. Sixty percent of those discharged on long-acting opioids were still on that treatment at follow-up. Occupational status of disability pensioners was identified as a determining factor for future opioid use. Opioid users had a lower health-related quality of life [18].

In our study, an increase in OME purchased by non-cancer pain patients was observed (from 27.9 kg in the year 2000 to 53.7 kg in 2006).

There is a clear difference in the pattern of opioid use among cancer patients and non-cancer patients. This might be due to the perceived shorter life expectancy in cancer patients and the longer medical experience in using opioids for treating cancer pain. As opposed to non-cancer patients, some might perceive that long-term side effects, such as decreased libido, or possible adverse effects to the immune system are much less relevant. Thus, the increase in opioid use among non-cancer patients will be lower than in cancer patients in addition to known existing barriers in prescribing opioids.

A limitation of our study is related to the unique characteristics of our study population of CHS members who are generally older and with a lower average income when compared with the rest of the Israeli population. However, as CHS covers nearly 3,800,000 members, we can assume that they are representative of most of the patients that receive opioids in Israel.

A study that evaluated trends of opiate use in Medicaid program in 49 states in the United States during the years 1996–2002 found overall increase of 309% in opiate pain medications, accompanied by large unexplained geographic variation in aggregate use [19]. In our study we did not find significant differences in opiod use in different areas of Israel.

Another limitation is that we could not identify the accurate indications for opioid purchasing among the non-cancer pain patients. We also did not obtain any other information regarding the

characteristics and impact of pain, such as absenteeism from work days and use of other health care services.

In our study we showed a clear increase in total OME. Some could claim that there are other factors that could have in uenced opioid purchasing patterns during the study period. However, no change in Israeli local and national regulatory policies or CHS policies for opioid control, availability, and costs for CHS members has occurred. Israeli citizens are allowed to change their membership in an HMO only after they have been enrolled for at least 6 months and in four specific dates during the year (1st of April, May, August, and October). Data from the National Insurance Institute of Israel show that during the years 2000–2006, 0.8–1.4% of the population insured in one of the four HMOs in Israel, and changed from one HMO to another. Thus, we can say that CHS-insured population remained stable.

Investment in medical education and increase of patients and families awareness to proper treatment of pain may be part of the explanation to the noted increase in opioid purchasing. This increase in opioid use is one potential indicator of the progress made in improving accessibility and availability of opioids in our health care organization.

Monitoring opioid use is an important indicator of pain management progress at an institutional or country level. Although the opioids purchasing data indicate a progress in pain management in our institution, there is still a need to improve pain management.

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