

# Profile of Analgesic Drugs Administration for Carpal Tunnel Syndrome in Dr. Soetomo General Hospital Surabaya

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## Profile of Analgesic Drugs Administration for Carpal Tunnel Syndrome in Dr. Soetomo General Hospital Surabaya

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### ABSTRACT

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**Introduction:** Carpal tunnel syndrome (CTS) is a group of neuropathic symptoms regarding the compression of the median nerve which passes through carpal tunnel. There has been a high prevalence of CTS in Indonesia, which leads to decreasing quality of life, lack of work productivity, and increasing health cost. Analgesic treatments have been the drug of choice for carpal tunnel syndrome for years. However, the effectiveness of the drug and the risk of the adverse effect of drugs have always been an issue for analgesic use. An observational study on the profile of analgesic drugs administration for carpal tunnel syndrome patients in Dr. Soetomo General Hospital Surabaya.

**Methods:** A descriptive observational retrospective study has been conducted to observe the profile of analgesic drugs administration, including type and dosage of drugs, classification of drugs, drugs administration route, an early and advanced type of analgesics, and duration of analgesic administration. Sociodemographic data and clinical characteristics (main symptoms) of carpal tunnel syndrome patients are also included in this study.

**Results:** Out of 202 subjects of this study, most patients are women (84,16%), the group age of 50-59 to years old, and the most frequent job is household wife (43,56%). The most common analgesic drugs used for carpal tunnel syndrome patients is 50 mg sodium diclofenac for 78 patients (38.61%). All of those subjects are administered with oral analgesic (100%). 185 patients (91.59%) are administered with analgesic combinations. The duration of analgesic usage is 7 days as an early analgesic in 82 patients (40.59%).

**Conclusion:** CTS is a syndrome due to median nerve compression of the hand, Women, household wife, and age of 50-59 years old are found to be vulnerable to this syndrome. Analgesic drugs mostly used is 50 mg natrium diclofenac, orally, combined, with the period of 7 days for early medication.

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## 2 Introduction

Carpal tunnel syndrome (CTS) is a syndrome caused by the compression of the median nerve along the carpal tunnel<sup>1</sup>. CTS has been the most prevalent cause of chronic neuropathic pain at the upper extremity<sup>2</sup>.

In the US, approximately 5 out of 100 people have CTS<sup>3</sup>. In a developing country, this number is significantly increasing. Approximately 300 patients come to the general hospital, diagnosed with CTS<sup>4</sup>. Population at risk for this condition is women and age group of 40 to 60<sup>5</sup>. Some comorbid conditions are also found in CTS, such as obesity, diabetes mellitus, hypothyroid, and pregnancy<sup>6</sup>.

CTS can be triggered by repetitive movements on wrists, such as flexion-extension, or a weight-bearing activity using wrist, for a long period of time<sup>7</sup>. These activities would cause compression on flexor retinaculum of the hand, putting pressure on the median nerve in it<sup>8</sup>. Patients will experience sensation of paresthesia, as the most common sensoric symptoms, and eventually, weakness of thenar muscles, as the most prevalent motoric symptoms<sup>9,10</sup>.

There is no mortality case reported for CTS. Although, this condition can lead to discomfort and pain, mood disorder, sleep disorder due to benign nocturnal paresthesia (BPN), a lower level of work productivity, and high absence rate in work<sup>11</sup>.

CTS patients often get analgesic drugs from neurology clinic for their symptoms<sup>5</sup>. This pharmacological therapy has been a pharmacological drug for CTS, but have no significant result compared to the use of placebo<sup>12, 13</sup>. Moreover, the use of analgesic drugs for chronic pain, such as CTS neuropathic pain, can lead to unnecessary drugs adverse effects, such as gastric irritation, renal and hepatic disorder<sup>14</sup>.

This study provided a profile of analgesic use for patients diagnosed with CTS in Department of Neurology Dr. Soetomo General Hospital Surabaya, with a period of January to June 2018. This study was expected to give a brief solution to analgesic drugs administration for CTS cases in the healthcare service, and to give brief comparison whether it has matched the treatment guideline for CTS or not.

## Methods

This research was a descriptive observational study. The research variables were analgesic drugs given to the CTS patients and the patients diagnosed with CTS. The population was outpatients' electronic medical record (EMR) data at Dr. Soetomo General Hospital Surabaya in the period of January - June 2018 with the diagnosis of CTS and received analgesic drugs. This study has received approval of ethical clearance from ethics commission of Faculty of Medicine Universitas Airlangga and Dr. Soetomo General Hospital Surabaya. Samples were obtained using consecutive sampling technique according to inclusion criteria which were patient who went to neurology clinic at Dr. Soetomo General Hospital Surabaya in January - June 2018 with a diagnosis of CTS and received analgesic

drugs. The exclusion criteria are incomplete EMR data. The data obtained will be analyzed and presented in the form of table using Microsoft Excel 2016.

## Results

Table 1. The characteristics of subjects

		n = 202
Sex	Male	32 (15,84%)
	Female	170 (84,16%)
Age	20-29	10 (4,95%)
	30-39	15 (7,43%)
	40-49	62 (30,69%)
	50-59	81 (40,10%)
	60-69	25 (12,38%)
	70-79	8 (3,96%)
Job	≥80	1 (0,50%)
	Private workers	3 (31,19%)
	Public workers	0 (14,85%)
	Household wife	88 (43,56%)
	Students	2 (0,99%)
	Teachers	7 (3,47%)
	Doctors	1 (0,50%)
Traders	1 (0,50%)	
Fishermen	1 (0,50%)	
Others	3 (1,49%)	
Non-workers	6 (2,97%)	

The results of this study revealed that from 202 patients, most patients are 170 female patients (84,16%), the majority of age is 50-59 years old (40,10%), and the most common job is household wife with 88 patients (43,56%).

Table 2. Types and doses of analgesic drugs

		n = 202
Types of analgesic drugs	Doses	
Paracetamol	300 mg	5 (2,48%)
	350 mg	1 (0,50%)
	400 mg	31 (15,34%)
	450 mg	4 (1,97%)
	500 mg	56 (27,71%)
Natriumdiclofenac	25 mg	3 (1,49%)
	50 mg	78 (38,61%)
Ibuprofen	300 mg	1 (0,50%)
	400 mg	9 (4,45%)
Meloxicam	7,5 mg	7 (3,47%)
	15 mg	2 (0,99%)
Celecoxib	100 mg	1 (0,50%)
Acetyl-salicylic acid	80 mg	1 (0,50%)
	100 mg	1 (0,50%)
No analgesic drugs		2 (0,99%)

The results of this study revealed that from 202 patients, most patients (38,61%) were given 50 mg sodium diclofenac.

Table 3. Drug administration route

n = 202	
Drug administration route	
Peroral	202 (100%)

The result of this study is all patients (100%) were administered by oral analgesic drugs.

Table 4 The duration of analgesic drugs use

n = 202				
	Early medication		Continuous medication	
<b>7 days</b>	<b>82</b>	<b>40,59%</b>	<b>10</b>	<b>4,95%</b>
<b>30 days</b>	56	27,27%	54	26,73%

The results of this study revealed that from 202 patients, most patients (40,59%) had their early analgesic drugs for their medication, for 7 days.

Table 5. The single or combination use of analgesic drugs

n = 202	
Single	Combination
<b>17 (8,41%)</b>	185 (91,59%)

The results of this study revealed that most patients (91,59%) received combination analgesic drugs. Combination drugs mostly used is with anticonvulsants (*diazepam*), tricyclic antidepressants (*amitriptyline*), and GABA analog (*gabapentin*). Some adjuvants are also used, such as vitamin B6 and B12.

## Discussion

The trend that occurs on CTS patients were classified into some points of patients' characteristics: sex, age, and jobs. For the sex category, CTS often occurs in women than in men (84,16%). Many studies from others also stated the same point<sup>2,4</sup>. This may happen because of hormonal conditions in women also interfere with the pain pathway. Therefore, a woman has a significantly increasing perception of pain<sup>15</sup>.

For age group, the most common age group that experience CTS is 50-59 years old (40,10%). This phenomenon is explained by the age level of productivity in the developing country, which is 15-59 years old<sup>15</sup>. After the productivity age, workers with repetitive movements of the arm would feel the symptoms of CTS. Moreover, anatomical-physiological changes of the human body due to aging causes the flexor ligament of the hand to thicken, compressing the median nerve and lead to CTS<sup>16</sup>. Comorbid and degenerative disease, such as diabetes

mellitus, hypertension, and other musculoskeletal disorder also known to be the risk factor of CTS in elderly<sup>8</sup>.

For the job category, CTS would likely to be found in the household wife (43,56%). In Indonesia, the job description for a household wife is to wash clothes manually, to sweep and to mop, to cook, etc., which all are repetitive movements<sup>17</sup>. Further explained, a job more than eight hours a day, without the ergonomic position and proper resting, would more likely to cause CTS<sup>18</sup>.

Patients with CTS complain paresthesia as the most agonizing symptoms. Paresthesia is defined as a tingling, pinned, burned, or discomfort sensation in the wrists, mostly in the first three fingers and the half fourth finger<sup>19</sup>. Paresthesia would occur to the nerve branch downstream to the location of compression, due to demyelinating of the median nerve because of the disruption of nerve microcirculation<sup>20</sup>.

50 mg natrium diclofenac is the most frequent analgesic drugs administered in the neurologic clinic at Dr. Soetomo general hospital. Eight patients were given under-dose or over-dose analgesic drugs. This would be ineffective to relieve the symptoms of CTS, even can lead to the adverse effect of analgesic drugs and increase the possibility of recurrence of CTS<sup>21</sup>.

Analgesic drugs for CTS are all given orally. The research stated that the route of drug administration would not affect the effectivity of drugs<sup>22</sup>. On the contrary, oral analgesic drugs would be easier for the patients to consume the drug<sup>23</sup>. Although, the effect of oral analgesic drugs toward gastrointestinal tracts should be carefully considered<sup>24</sup>.

As mentioned above, the period of analgesic use will determine whether there will be adverse effect of drugs or not. Annual Report of the American Association of Poison Control Center National Poison Data System stated that analgesics give the highest number of overdose case, approximately 10% of all cases. Toxicity effects due to a long period of analgesic use also reported, such as seizure, metabolic acidosis, acute renal failure, even comatose until death.

Analgesic drugs are not very effective if administered without combination with other drugs, such as gabapentin, amitriptyline, and diazepam as an analgesic for chronic pain, and vitamins, including B1, B6, and B12<sup>21</sup>. Also, combination of analgesic drugs would significantly decrease the adverse effect of drugs<sup>24</sup>.

Eventually, careful observation from the general practitioner and neurologist are necessarily needed to control the use of analgesics, to increase the effectivity and to decrease the adverse effect of the drugs, especially for CTS.

## Conclusion

CTS is a syndrome due to median nerve compression of the hand, causing symptoms such as paresthesia, numbness, pain, and thenar muscle weakness. Women and age of 50-59 years old are found to be vulnerable to this syndrome. The analgesic drugs often become the drug of choice to decrease the symptom of CTS, but this

also increases the risk of having the adverse effect of the drugs. Careful watch from general practitioner is needed to increase the success of this therapy towards CTS.

#### CONFLICT OF INTEREST

The author stated there is no conflict of interest in this study.

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