

A clinical audit of interventional pain procedures performed as part of the newly initiated pain service in a local neurosurgical centre

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ABSTRACT

Interventional Pain Procedures (IPPs) is a relatively new treatment modality for chronic pain in Malaysia. The Interventional Pain Service (IPS) newly set up in our institution is led by a pain neurosurgeon and provides a whole package of multimodal pain management including different range of IPPs. This clinical audit is to examine the quality of IPPs performed within the IPS in our institution since its initiation. A total of 87 IPPs were performed on 56 chronic pain patients over 3-year duration. As high as 81.8% of the procedures were effective and 81.5% of patients were satisfied. Only one minor transient complication occurred after an intradiscal procedure but none resulted in death or permanent disability. Thus, safe and effective IPPs can be provided as part of IPS in a local neurosurgical pain centre to bring more comprehensive and less fragmented care for chronic pain patients.

KEY WORDS:

Interventional Pain Procedures, interventional Pain Service, neurosurgery, chronic pain

INTRODUCTION

Chronic pain, defined as non-cancer pain persisting more than 6 months,¹ affects as high as 7.1% of adult population² and even up to 15.2% among the elderly³ in Malaysia. It brings significant impact on individual quality of life (QOL) as well as on the public healthcare expenditure.¹ Various forms of treatment were sought and later a multidisciplinary biopsychosocial approach had been advocated for these patients, including a combination of pharmacological therapies, physiotherapy, cognitive behavioural therapy, interventional pain procedures (IPPs) and pain surgeries.^{4,5}

IPPs is a rapidly emerging and recognized mode of treatment for chronic pain that can be applied independently or concurrently with other therapies.⁶ It involves interventional techniques like nerve blocks, radiofrequency treatment and neuromodulation procedures that are firmly linked to a biomedical model of pain.⁴ It can be performed by trained clinicians from various specialties involving in pain

management including neurosurgeons who have been founders of surgery on the nervous system and pain.⁷

In Malaysia, the field of pain management has progressed with the implementation of the above mentioned multimodal approach involving all aspects of healthcare providers - doctors, nurses, psychologists, physical and occupational therapists - as well as patients themselves.^{5,8} The introduction of IPPs was considered quite recent in our country in which it is usually performed by various specialists predominantly from anaesthesiology and others from orthopaedics, neurosurgery, radiology and rheumatology.

To facilitate a comprehensive care for patients with chronic pain requiring IPPs,⁷ the Neurosurgery Team in our institution has established a pioneer Interventional Pain Service (IPS) since May 2012. This service is run by a devoted team consists of qualified pain neurosurgeon, pain physician, physiotherapists, psychologists and nurses with dedicated clinic, operating theatre list, minor procedure list, inpatient as well as outpatient service to provide a diverse range of IPPs (from injections to microvascular decompression and spinal cord stimulation) and other chronic pain related therapies. It reduces the inconvenience to patients and eliminates the need for multiple interdisciplinary referral leading to fragmented care. This clinical audit aims to review all IPPs performed since the inception of this IPS to examine the effectiveness, patients' satisfaction and complications in hopes of continuous improvement.

MATERIALS AND METHODS

A retrospective review was carried out on all IPPs performed in our IPS from May 2012 to June 2015. All procedures and corresponding patients' detail were traced from the hospital's electronic database and patients' clinical notes. It is a norm that all patients were reassessed by a pain neurosurgeon two hours post procedure and on the subsequent follow-up (three weeks later and then three months later). Procedures with no proper documentation and IPPs done by other specialties were excluded.

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Table I: Types of procedure performed and studied in this audit and its corresponding effectiveness

Procedure	Total number	Effective procedures (%)
Block		
Peripheral Nerve Block	10	6 (66.7%) #
Sacroiliac Joint Block	18	13 (76.5%) #
Facet Block	15	13 (92.9%) #
Nerve Root Block	6	6 (100.0%)
Pyriformis Block	4	4 (100.0%)
Rami Communicantes Block	2	0 (0%) #
Ganglion Block	3	3 (100.0%)
Transforaminal Epidural Block	6	3 (50.0%)
Sympathetic Block	1	Missing data #
Total	65	48 (80.0%) (n=60, 5 missing data)
RFT		
Peripheral Nerve RFT	3	2 (100.0%) #
Sacroiliac Joint RFT	1	1 (100.0%)
Nerve Root RFT	1	1 (100.0%)
Ganglion RFT	2	2 (100.0%)
Total	7	6 (100.0%) #
Microvascular Decompression	6	4 (80.0%) #
Intradiscal Electrothermal Therapy (IDET)	4	2 (66.7%) #
Intra-Bursa Injection	1	1 (100.0%)
Neurolysis	1	1 (100.0%)
Microdiscectomy	1	1 (100.0%)
DiscFx	1	Missing data #
Discogram (diagnostic)	1	Not applicable
TOTAL PROCEDURES	87	63 (81.8%) (10 unavailable data)

1 missing data

RFT, Radiofrequency Treatment

Data was collected to delineate basic demography, details of procedures and patients' response to the intervention. Similar to another quality assurance study for IPPs, 6 three main indexes were used to measure the quality for IPPs, namely the effectiveness in pain relief, patients' satisfaction, and presence of adverse effect. Although objective pain score from numerical rating or visual analogue scale (VAS) is encouraged to be assessed routinely upon follow-up, it was not consistently documented in our setting. This has thus limited its' application in this retrospective audit. Instead, patients' commentary and qualitative description on perceived changes in pain after treatment was obtained and used. (The routinely asked questions include: What's the percentage of reduction in pain? Is there more than 50% improvement compared to before treatment? Are you satisfied with the result of treatment?) Effective pain relief is defined as more than 50% reduction in pain from baseline upon reassessment as described earlier. Patients' satisfaction was according to individual subjective, non-systematic commentary following the above questions. The results were then analysed using SPSS® version 21.0 (Chicago, Illinois, USA).

RESULTS

In total, 87 IPPs were performed between May 2012 to June 2015, involving 56 patients with each patient underwent 1 - 5 procedures respectively (median 1, mean 1.55). The mean age of patients was 54.4 years (sd 14.61) with female preponderance (male:24, female:32) (Figure 1A). The patients were mainly referred from other specialities within the same institution (42.9%) while another 23.2% had been under neurosurgical follow-up for other non pain related pathologies before referral for IPS. Most patients presented

with pain at limbs and lower back region (Figure 1B). On average, these patients had undergone 0.436 procedures (sd 1.13; range 0-7; 1 unavailable data) previously at other institution(s) prior to seeking treatment here.

Since the inception, the average number of cases increased gradually from 0.88 case/month in 2012 to 4.00 case/month in 2015 (Figure 1C). Of all procedures, 66 were done under local anaesthesia without sedation, 15 procedures under local anaesthesia with sedation and another six were under general anaesthesia for microvascular decompression. Only one procedure was done for purely diagnostic purpose while the rest had both diagnostic and therapeutic intention. Majority of the procedures (31.0%) were done at the lower back region. Blocks and injections made up 74.7% of total procedures and another 8.0% were radiofrequency treatments (radiofrequency ablation and pulsed radiofrequency) (Table I).

As high as 81.8% of the procedures led to effective pain relief as defined by more than 50% reduction in pain (Table I). Up to 81.5% of patients were satisfied with the outcome of intervention (Figure 2). Only one patient had complication resulted in unintended transient groin numbness after an intradiscal procedure. Upon further analysis, authors found that patients' satisfaction was not related to the number of IPPs performed in our institution (average 1.614 procedure/satisfied patients vs 1.300 procedure/unsatisfied patients, t-test p>0.05, n=54). Instead, the unsatisfied patients were associated with significantly higher number of previous procedures done elsewhere compared to those satisfied (Mann-Whitney U test p<0.05, n=54) (Figure 2). Furthermore, the higher the number of previous procedures were associated with a lesser effectiveness in procedures they had presently

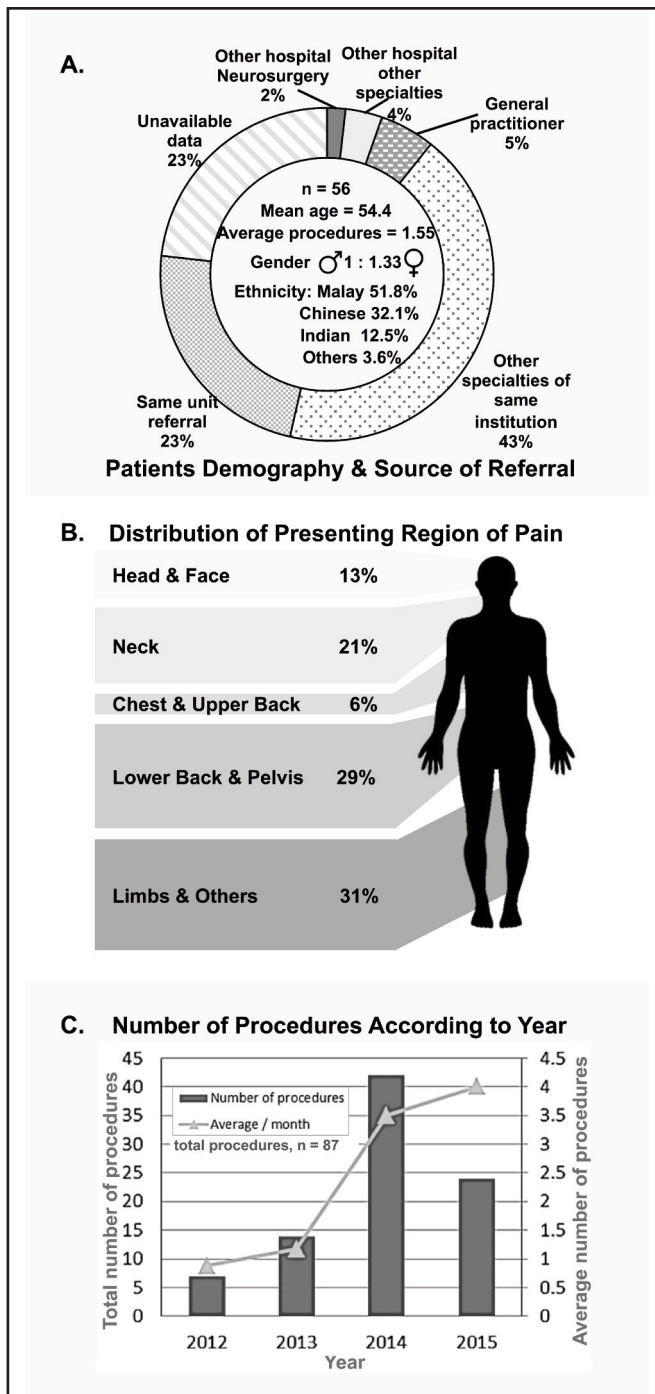


Fig. 1: Basic demography and details of audited IPPs. A, Patients' demographic distribution and source of referral (in pie chart). n represents total number, ♂ represents male and ♀ represents female. B, Distribution of presenting region of pain in our patients. C, The number of procedures performed per year and average of procedures done per month from June 2012 to May 2015.

(Spearman's correlation coefficient -0.442, $p < 0.05$). Otherwise, the patients' satisfaction and effectiveness of procedures were not related to factors such as age, gender, race and body regions of intervention.

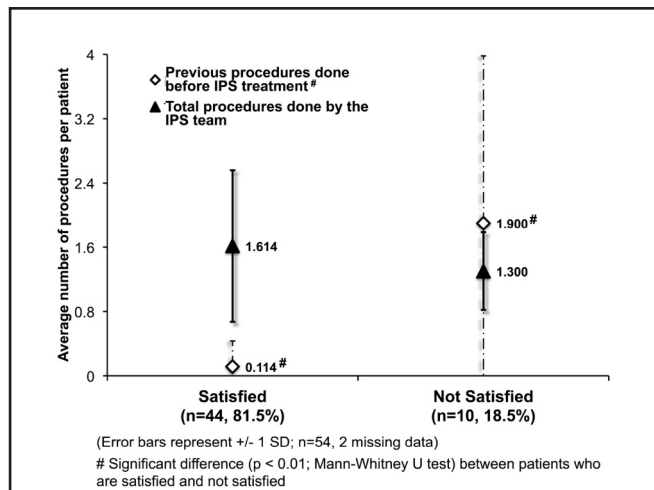


Fig. 2: Patients' satisfaction rate as well as the difference in number of current procedure and number of previous procedure between satisfied and unsatisfied patients. Graph showed a significantly higher average number of previous procedures done elsewhere in those not satisfied with current treatment.

DISCUSSION

Our results on effectiveness and patients' satisfaction were comparable with published data from other IPPs centres (69.7-75.7% effectiveness,^{5,6} 89.7% satisfaction).⁶ Only one procedure resulted in an unintended groin numbness that eventually resolved after several months. Thus, an effective pain intervention can be safely provided by a trained neurosurgeon with appropriate support facilities.

The average number of procedures being done in our centre was increasing with time due to the uprising awareness on the availability of IPS. This was supported by the fact that most patients were referred from within the hospital itself where awareness is present while referral from other institutions were minimal. Hence, it is essential to educate all healthcare providers as well as the community regarding the existence of this service and allow patients to receive optimal treatment as desired.¹ Nearly all of the procedures in our study were done under local anaesthesia with or without sedation. This showed that most IPPs can be done under daycare surgery and thus reducing the costs associated with hospital admission and risks related to general anaesthesia.

The average number of procedures our patients received (mean 1.55, range 1-5) was mainly due to two factors: the need for multistage therapy for certain pathology and the presence of different pathologies within the same patient. The female preponderance in our study population is similar to previous studies conducted both locally (1:1.96)⁵ and abroad (1:2.10).⁶ It could be due to the higher number of female patients actively seeking treatment as well as the gender differences in the response to pain interventions.⁹

Besides lower back pain, majority of patients presented with pain in the limbs which were mainly radicular in nature due to spinal pathologies. It has been shown that low back pain

was present in as high as 12-35% of the population¹⁰ while spinal pathologies attributed to 59.7% of patients with chronic pain.⁵ It is possibly the complexity of the spinal and back pathologies with multiple pain generators that resulted in difficulty to achieve effective treatment in a single setting and thus leading to the high prevalence and the need for multiple interventions.

Patients who had multiple previous procedures were found to have lesser satisfaction and effectiveness in our treatment. It is possible that these represent the complex cases leading to difficult diagnosis and challenging treatment. Patients' perception on previous failed interventions may also affect their subjective judgement on the effectiveness and satisfaction on current interventions. Hence, it is essential that an accurate diagnosis should be achieved at an early stage so that correct treatment can be offered to appropriate patients to achieve an effective and satisfactory result.⁶

The authors agreed that this audit carried many limitations despite the motivating results. As it is based on merely retrospective review, many incomplete or unavailable data can affect the strength of this analysis. The evaluation on patients' satisfaction and effectiveness of procedures by respective surgeons were subjective and could be biased. It could be further improved if objective pain assessment tools (for example the visual analogue scale) were consistently used.^{5,6} Parameters such as QOL assessment and patients' functional status,⁵ if included, may give a broader perspective on the outcome evaluation. Therefore, a properly designed registry and future studies with validated quantitative outcome evaluation should be considered.

CONCLUSION

This study showed that safe and effective IPPs can be introduced and included into a neurosurgical centre with trained pain neurosurgeons, where a range of interventions from simple injections and minimally invasive procedures to neuromodulation and even complex open surgeries can be done.⁷ A comprehensive IPS may provide less fragmented care for patients with chronic pain. This pilot audit directs us to future proper registry with prospective and objective outcome evaluation to improve the management of chronic pain in Malaysia.

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