Consideration of the Efficacy of Nerve Block Therapy and Trigger Point Injection (Tender Point Injection) Therapy in Fibromyalgia

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Abstract: Fibromyalgia (FM) is a disease of uncertain cause that is associated with chronic widespread pain and tenderness. Because the cause of FM is unclear, there is currently no curative treatment. Guidelines recommend pharmacotherapy such as pregabalin, duloxetine, amitriptyline and milnacipran hydrochloride and non-pharmacotherapy such as aerobic strengthening exercise, resistance exercise, water exercise and cognitive behavioral therapy as evidence-based therapies. However, some patients remain unable to manage their symptoms with these therapies and seek other effective treatments. Such treatments include nerve block therapy and trigger point injection (TPI) therapy. TPI is not strictly defined as nerve block therapy, but it is sometimes included in the nerve block therapy group. To date, no randomized controlled trials have been conducted to evaluate nerve block therapy for fibromyalgia alone, although many case reports have been published in Japanese. In this mini-review, we summarize and review nerve block therapy and trigger point injection therapy in English.

Keywords: fibromyalgia, nerve block, trigger point injection (tender point injection)

Introduction

The primary symptom of FM is widespread pain. Various autonomic nervous system symptoms—including insomnia, psychoneurotic symptoms such as depression, irritable bowel syndrome, reflux esophagitis, and overactive bladder—are secondary FM symptoms\(^1\).

As the cause of FM is not clear, there are no curative treatments. Currently, the goal of treatment is to increase a patient’s quality of life through management of the aforementioned primary and secondary symptoms.

Guidelines recommend pharmacotherapy such as pregabalin, duloxetine, amitriptyline and milnacipran hydrochloride and non-pharmacotherapy such as aerobic strengthening exercise, resistance exercise, water exercise and cognitive behavioral therapy as evidence-based therapies\(^1\). Some of these evidence-based therapies can enable a patient to achieve control of symptoms, but some patients remain unable to manage their symptoms with these therapies despite their best efforts. For this reason, many patients seek treatment options with efficacy that has not yet been established based on adequate evidence and receive not only traditional mainstream therapies but also alternative therapies\(^2\)\(^-\)\(^5\).

One such treatment is nerve block/trigger point injection (TPI) (tender point injection) therapy. To date, no randomized controlled trials (RCTs) have been conducted to evaluate the performance of nerve block therapy as a treatment for FM alone. In addition, while there have been some case reports published in Japanese, few have been written in En-
glish. A reason for that is that these treatments are prescribed more readily in the medical environment in Japan. It may become necessary in the future to also review the current medical literature on treatments without supporting evidence for patients whose symptoms cannot be fully controlled through evidence-based therapy. In this paper, we summarize and review nerve block/trigger point injection therapy for FM in English.

Nerve block and trigger point injection therapy

There are two methods of achieving a nerve block: to block a nerve or nerves corresponding to the painful region, and to administer a stellate ganglion block (SGB) aimed at curing the disease itself. TPI can also be used to inject local anesthetic into tender points. Strictly speaking, TPI is not a nerve block, but TPI is often administered and is considered an easier and safer method than nerve block, so this review considers both nerve block and TPI for treating fibromyalgia. SGB is utilized for face, neck, and upper limb pain, as well as for treating hot flashes. It is employed to treat systemic diseases such as autonomic imbalance and fibromyalgia in Japan, where it has a broader range of indications than in other countries. There is no evidence that SGB helps cure a broader range of diseases. Dr. Bunkichi Wakasugi, who established a Pain Clinic department for the first time in Japan, suggested that SGB strengthens the natural healing force by increasing cerebral blood flow, especially hypothalamic blood flow. Some medical doctors who have observed improvement of their patients’ conditions after SGB believe Wakasugi’s theory is correct, even though there is no evidence, and they administer SGB for treatment of diseases such as fibromyalgia.

While evaluating the efficacy of nerve block therapy/TPI therapy in FM, it is important to consider two things. First, nerve block therapy is not a curative treatment, but is an adjunctive therapy for pain control to improve the quality of life (QOL). Apart from nerve block therapy, other treatments such as drug therapy are also available for improving the QOL. Second, the current state and availability of nerve block/TPI therapy greatly differ, depending on the country and region. This may create a sense of inequality among patients.

For example, patients in some areas of Japan have daily or weekly access to nerve block therapy because the out-of-pocket cost per treatment is approximately $25 to $50 (approximately $5 for TPI), and there are no overwhelming lines of waiting patients. Conversely, medical care is free in London; however, as there are many patients on the waiting list, most patients can only receive nerve block therapy via private healthcare. In private healthcare, the out-of-pocket cost per treatment is approximately $500 to $5000. In addition, as there are still many patients on the waiting list, it is impossible for them to receive block therapy every day or every week. In the future, we need to consider global equalization of the medical environment for prescription nerve block/TPI therapy as much as possible.

Fibromyalgia and nerve block therapy

The search was conducted in English and in Japanese with the keywords fibromyalgia and nerve block, or fibromyalgia and trigger point injection, or fibromyalgia and tender point injection, or those three, as well as randomized controlled trial. Results of conducting this search strategy in PubMed, Cochrane Review, Google Scholar, and Ichushi (a Japanese database), as of August 31, 2017, are presented in Table 1.

Although there is no RCT on nerve block therapy in FM patients alone, there is one in which a sphenopalatine ganglion block (SPGB) was used to treat 42 patients with FM and 19 patients with myofascial pain syndrome (MPS). Scudds et al. conducted a trial on SPGB, using lidocaine (4%) or saline (placebo), on a total of 61 subjects. Although pain reduction was achieved in 21 patients (10 patients in the lidocaine group versus 11 in the control group), these data suggest that, 4% lidocaine is no better than placebo in the treatment of chronic muscle pain in this population.

Although not an RCT, Bengtsson et al. conducted a prospective cohort study that investigated the efficacy of SGB in patients with FM. Of the 28 patients with FM, 8 were administered bupivacaine...
via SGB, and 10 controls were similarly administered saline; the remaining 10 patients were administered intramuscular injections of bupivacaine. Their results showed that the number of tender points and pain at rest were significantly reduced with SGB using bupivacaine\textsuperscript{15}).

A limited number of studies investigated nerve block therapy in patients with FM, but there are no qualitative/quantitative systematic reviews or meta-analysis data. However, 1 and 13 case reports found in PubMed and Ichushi, respectively, showed the efficacy of nerve blocks in FM.

Date et al. reported two cases in which SGB was effective\textsuperscript{16}). Case 1 was a 49-year-old female FM patient who was hospitalized and who received SGBs daily because she was resistant to drug therapy. Her severe pain subsided after 2 weeks, and she continued to receive SGBs daily for 4 months. Subsequently, she was discharged from the hospital, as the symptoms were relieved.

Case 2 was a 24-year-old male FM patient who was hospitalized and who received SGBs daily because he was resistant to drug therapy. He could sleep at night from the third week, and his symptoms gradually improved. He continued to receive SGBs daily for 3 months before he left the hospital. The patient was able to return to work after discharge from the hospital.

No improvement was observed in these patients after the first SGB; however, their symptoms started to improve after the 14th SGB (Case 1) and the 21st SGB (Case 2).

In Japan, there are regions where patients can receive SGBs daily. However, compared with patients in Japan, not many patients in other countries have daily access to nerve block therapy.

Tsuneto et al. reported two cases in which symptoms of FM were alleviated by a combination of continuous epidural blocks and drug therapy\textsuperscript{17}). In both cases, drug therapy combined with a single epidural block did not show any effect. However, continuous epidural block resulted in pain reduction, and the patients’ responses to drug therapy improved, along with an improvement in activities of daily living.

Tabuchi et al. reported a case in which long-term (5-month long) continuous epidural block was effective in refractory FM\textsuperscript{18}). However, from a global point of view, this may not become a common treatment method because few patients have access to long-term (5-months) hospitalization and block therapy.

Yasuda et al. reported a case in which pain was alleviated by 7 consecutive days of SGB combined with drug therapy and autogenic training in a patient with FM who did not respond to drug therapy alone\textsuperscript{19}).

\begin{table}[h]
\centering
\begin{tabular}{|l|l|l|l|l|l|}
\hline
Author & Years & Where published & Type of report & Number of subjects & Patient characteristics & Type of therapy \\
\hline
Scudds et al. & 1995 & Canada & RCT & 61 & FM (42 patients) and MPS (19 patients) & spheno-palatine ganglion blocks \\
Bengtsson et al. & 1988 & Sweden & prospective cohort & 28 & FM & SGB \\
Date et al. & 2004 & Japan & case reports & 2 & FM & a case with daily SGBs for 4 months and another case with daily SGBs for 3 months \\
Tsuneto et al. & 2011 & Japan & case reports & 1 & FM & combination of continuous epidural blocks and drug therapy \\
Tabuchi et al. & 2009 & Japan & case report & 1 & FM & 5-month long continuous epidural blocks \\
Yasuda et al. & 2007 & Japan & case report & 1 & FM & epidural blocks combined with drug therapy \\
Nakamoto et al. & 2006 & Japan & case report & 1 & FM & 7 consecutive days of SGBs combined with drug therapy and autogenic training \\
Nakamura et al. & 2014 & Japan & case reports & 2 & FM & a case with SGBs, dorsal acapular nerve blocks and trigger point injections, and another case with lumbar epidural blocks and trigger point injections \\
Nakajima et al. & 2016 & Japan & case report & 1 & FM & sacral epicural blocks \\
Shiraishi et al. & 2012 & Japan & case reports & 4 & FM & K-point blocks \\
\hline
\end{tabular}
\caption{Results of conducting the search in English and in Japanese with the keywords \textit{fibromyalgia} and \textit{nerve block}, or \textit{fibromyalgia} and \textit{trigger point injection}, or \textit{fibromyalgia} and \textit{tender point injection}, or those three, as well as \textit{randomized controlled trial} in Pubmed, Cochrane Review, Google Scholar, and Ichushi (a Japanese database), as of August 31, 2017.}
\end{table}
Nakamura et al. reported a case in which the symptoms were relieved by SGB, dorsal scapular nerve block, and trigger point injections, and another case in which the symptoms were relieved by lumbar epidural blocks and trigger point injections.

We reported a case in which the symptoms were alleviated by sacral epidural blocks. We have managed and reported one of the two cases in which reduction of pain in the lower extremities was achieved by sacral epidural blocks, followed by improvement in other regions. Although the factors affecting the efficacy of sacral epidural block in regions other than the lower extremities are unclear, mental factors may be contributory. In patients with generalized pain, once the pain is partially alleviated, the mental burden and pain in other regions may also be alleviated.

Shiraishi et al. reported four cases in which a K-point block was effective for relieving symptoms of photophobia and deep orbital pain in patients with FM. K-point block is a procedure in which a local anesthetic is administered into the edge of the sternocleidomastoid muscle. It was initially proposed by Dr. Shouichi Kokubun (former professor of the Department of Orthopedic Surgery, Tohoku University School of Medicine). This procedure has been reported to be effective in treating headache, neck pain, spondylosis deformans, neck-shoulder-arm syndrome, and myofascial pain. Horner’s sign is sometimes observed after a K-point block. Although the mechanism of action is unknown, it has been suggested that K-point block has sympathetic blocking effects due to the action of the local anesthetic on the sympathetic nerve fibers diverging from the K-point block site. Although its difference from occipital nerve blocks appears to be one of the causes, the insertion points are clearly different anatomically. Shiraishi et al. reported that K-point blocks resulted in pain relief in all four patients with FM who had initial symptoms of photophobia and deep orbital pain.

Fibromyalgia and trigger point injection (tender point injection)

According to two RCTs conducted by the same author on the efficacy of TPI in FM, both TPI with local anesthetic and TPI with saline reduced pain. In a prospective cohort study that examined the clinical course (observation period, 11.2 years) of 41 patients with TM who received TPI (mean number of trigger points, 3.97), the period of pain reduction lasted an average of 13 to 15 weeks. In another prospective cohort study in which patients with FM received TPI, the range of motion was immediately improved, while the pain intensity and pain threshold showed improvement by the second week, exhibiting a delayed response.

Conclusions

There are few studies on this topic, and the sample sizes are small. That is because it appears to be very difficult to conduct studies on this topics and RCTs because there are many limitation, including the influence of other treatments (e.g., change of medications) and the number of patients who have access to long-term treatment. The symptoms of FM are varied, and the types of blocks, treatment sites, and treatment regimens also vary in different cases and vary with time even though the same patient. A single nerve block may not be sufficient to observe significant effects, since continuous or long-term treatment is often required.

The types of blocks, TPI sites, and treatment regimens used in the studies cited in this paper vary depending on the study, and we cannot determine which types of blocks and TPI are preferable. Although the evidence is limited, some reports have suggested that TPI is more effective than other methods. Thus, it may be better to let patients choose from the available methods for pain control, including nerve block therapy and TPI, after explaining the advantages and disadvantages of each method.

Competing interests

The author declares that she has not competing interests.
References


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要旨：線維筋痛症は原因不明の広範囲の慢性疼痛と圧痛を特徴とする疾患である。線維筋痛症の発症機序が明らかでないため、根治療法はない。ブレガバリン・デュロキサチン・アミトリプチリン・ミルナシプランなどを使用した薬物療法、有酸素強化運動、抵抗運動、水中運動、認知行動療法などがガイドラインでエビデンスのある治療法として推奨されているが、それらの治療法だけでは線維筋痛症の症状をコントロールできない患者もいる。そのため、エビデンスが十分がない他の治療法を試みている患者も多く、そのような治療法の中に神経ブロック・トリガーポイント注射がある。トリガーポイント注射は、厳密には神経ブロックではないが、神経ブロック治療の一つとして行われていることが多い。現在、線維筋痛症に対してだけの神経ブロックの効果を検討したランダム化比較試験は報告されていない。しかし、線維筋痛症患者に対する神経ブロックによる効果を日本語で報告した症例報告は数多くある。このレビューパーカーでは、線維筋痛症に対する神経ブロックとトリガーポイント注射の効果に関する報告を集め、英語で報告を行う。

キーワード：線維筋痛症、神経ブロック、トリガーポイント注射

PROFILE

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1994年 慶應義塾大学理工学部計測工学科卒業
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