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Observational Study

Patient preference for trigger finger treatment

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Abstract

BACKGROUND

Trigger finger is a common disorder of the hand that can cause disabling symptoms. Treatment options range from conservative management with observation and splinting, to surgical release, but there is currently not a consensus on a treatment algorithm.

AIM

To determine patient preference for the treatment of trigger finger using an online survey.

METHODS

An online crowdsourcing platform, Amazon Mechanical Turk, was used to recruit participants for this study. Participants were led through a scenario in which they were diagnosed with trigger finger. They were then asked to rank their preference of treatment options from the following: Observation, splinting, corticosteroid injection, surgery. The results of the surveys were then analyzed using R software.

RESULTS

Of 323 participants completed the survey. 7 participants were excluded because they failed to correctly answer the attention question, leaving 316 participants whose results were included. As a first choice for treatment 117 (37%) of the included participants chose observation, 86 (27%) chose splinting, 61 (19%) chose corticosteroid injection, and 52 (16%) chose surgery. The mean rank for observation was 2.26, for splinting was 2.30, for corticosteroid injection was 2.53, and for surgery was 2.91. The ranking of each treatment option was statistically different (P value < 0.05) from the others except for observation and splinting.

CONCLUSION

The practice of shared decision making with patients is imperative to providing the best care possible. The results from this study, especially the preference for less invasive treatment, may help providers better frame discussion around treatment options of trigger fingers. This in turn, may increase patient satisfaction

in the treatment of trigger finger.

Key Words: Trigger finger; Trigger digit; Hand surgery; Shared decision making

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Core Tip: Given the lack of current consensus on ideal management of trigger fingers, it is imperative for providers to pursue shared decision making with their patients. The results from this study may help providers better frame discussion around treatment options of trigger fingers. This, in turn, should lead to increased patient satisfaction.

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INTRODUCTION

Trigger finger, or stenosing flexor tenosynovitis, is a disorder of the hand which causes catching, or 'triggering', of the finger with extension of a flexed digit. This in turn can lead to difficulties with activities of daily living and interfere with patient's work. It is one of the most common causes of hand disability, effecting between 2%-3% of the worldwide population[1]. The variability of symptoms is large, with mild symptoms being pain, and more severe symptoms including flexion contractures of the involved digit(s). The specific etiology of trigger finger has yet to be determined but multiple theories exist[1]. Treatment options range from conservative management with observation or splinting, to one of the most common options, corticosteroid injection, to surgical intervention with percutaneous or open release, with no clear guidelines on an algorithm[2]. The choice of treatment depends on patient and surgeon preference. There is currently a plethora of research indicating that patients seek to be more actively involved in their care with the use of a shared decision-making framework[3-5]. The goal of this study was to determine patient preferences regarding trigger finger in an effort to better prepare providers for shared decision-making conversations with their patients.

MATERIALS AND METHODS

An online, survey based, descriptive study was performed through the use of a crowdsourcing website, Amazon Mechanical Turk (AMT). Participants for this study were randomly recruited through AMT. Studies have shown that AMT produces results similar to conventional surveying techniques and the population surveyed is representative of the United States internet population[6-8].

AMT workers must be older than 18 years of age to participate on the platform. Survey participants are screened through AMT to ensure that the same individual cannot complete multiple responses. AMT screens participants to ensure quality responses. Additionally, an attention check question was included to verify the quality of the responses. If a survey participant failed the attention check, their response was excluded.

If a participant completed the survey and adequately responded to the attention check, they were compensated ($0.20 *per* unique response) through the AMT platform for their time.

Attention check question

In an effort to ensure that participants were paying close attention to the prompts, questions, and giving meaningful opinions about the prior, an attention check question was inserted into the survey as follows.

"Attention check. Please select answer 3 if you are paying attention".

Respondents who did not answer this question correctly were excluded from the study.

Survey questions

The authors devised the survey in an effort to simulate a real clinical scenario. The participants were presented with the following scenario and questions. It begins as follows:

Scenario I: Trigger finger is a common problem affecting the hand. Patient's report pain and a clicking sensation with motion of the finger. The affected finger can catch or lock when trying to make a fist. Symptoms can limit the ability to grasp or hold objects. (A short 8 s video was made available to the respondents *via* a hyperlink that showcased an example of a trigger finger). Assume that your doctor has diagnosed you as having trigger finger.

Your doctor discusses the following options for treatment: (1) Observation: 50% of patients with trigger finger will get better without any treatment, most within one year[9]; (2) Splint: A restrictive splint keeping the finger straight will be worn on the involved finger. You are told this treatment option resolves symptoms 55% of the time[10]; (3) Cortisone injection: A very small steroid injection will be administered in the office. Some patients experience temporary pain from the injection. Symptoms resolved after one injection for 45% of patients, after two injections 60% of patients, and after three injections 76% of patients[11,12]; and (4) Surgery: Open release of the structure that causes the trigger resolves symptoms > 90% of the time[2].

Question 1: Which treatment option would you initially choose?

Observation

Splinting

Cortisone injection

Surgery

Participants were then asked to rank the remaining treatment options based on how they would prefer to be treated for their trigger finger.

Data analysis

Results from the survey were pooled and mean ranking was calculated using Microsoft Excel Online (Redmond, WA). The statistical review was then completed by a biomedical statistician. To assess the variance of mean ranking of each treatment type a Friedman Rank Sum Test was run. Additionally, a pairwise Wilcoxon Rank Sum tests with a Bonferroni adjustment for multiple comparisons was run to allow analysis of the difference in rankings between treatment types. This analysis was completed using R software (Boston, MA).

RESULTS

A total of 323 participants completed the survey *via* AMT. 7 participants were excluded because they failed the attention check question, leaving 316 participants who were included in the study, as seen in Figure 1.

Following the prompt asking which treatment option they would initially choose, 117 (37%) participants opted for observation as their first preferred method of treatment *vs* 86 (27%), 61 (19%), and 52 (16%) participants who responded with splinting, a cortisone injection, and surgery, respectively, as their first preferred method of treatment. Participants were then asked to rank what their second, third, and fourth preferred methods of treatment would be.

These results can collectively be seen in Table 1.

The mean ranking for observation was 2.26, for splint 2.30, for cortisone injection 2.53, and for surgery 2.91. The Friedman Rank Sum of this data was then calculated and the Chi-Squared was 50.5 with a P value less than 0.00001. These results can be seen in Table 2.

A pairwise comparison using Wilcoxon Rank Sum Tests was then performed revealing significant differences (P value < 0.05) in all treatment choices relative to one another, except for observation *vs* splint. These results can be seen in Table 3.

DISCUSSION

Epidemiology

As previously noted, trigger finger has an estimated lifetime incidence in 2%-3% of the population[1]. It most often affects middle-aged women (2-6 times as likely as men) in their dominant hand[13,14]. The ring finger is the most commonly affected digit, followed by the middle finger, index finger, and little finger (excluding the thumb)[15]. The constellation of diseases that constitute metabolic syndrome, specifically diabetes, hypertension, and dyslipidemia, have all been shown to be risk factors[15]. The incidence is also increased in patients with other hand conditions, including carpal tunnel syndrome, de Quervain's tenosynovitis, and Dupuytren's contracture[16]. Diabetes mellitus puts patients at elevated risk of developing trigger finger, with lifetime incidence in this subset of the population estimated at 10%[17]. The risk of developing trigger finger, as well as the severity of symptoms, is positively correlated with elevated glycosylated hemoglobin levels, specifically HbA1c levels greater than 7%[18].

The diagnosis of trigger finger is relatively straightforward. Patients report a locking or catching sensation with active range of motion of a digit. There may be pain with motion and motion of the digit

Table 1 Patient preference for treatment of trigger finger

	Observation	Splint	Cortisone injection	Surgery
1st Choice	117 (37%)	86 (27%)	61 (19%)	52 (16%)
2nd Choice	69 (22%)	96 (30%)	93 (29%)	58 (18%)
3rd Choice	61 (19%)	86 (27%)	97 (31%)	72 (23%)
4th Choice	69 (22%)	48 (15%)	65 (21%)	134 (42%)
Sum	316	316	316	316

Table 2 Descriptives of rank for each treatment option

	N	Mean ranking	Standard deviation
Cortisone injection	316	2.53	1.02
Splint	316	2.30	1.03
Surgery	316	2.91	1.12
Observation	316	2.26	1.17

Table 3 Pairwise comparison using Wilcoxon Rank Sum Tests (*P* value)

	Cortisone injection	Splint	Surgery	Observation
Cortisone injection				
Splint	0.0426[a]			
Surgery	< 0.00001[a]	< 0.00001[a]		
Observation	0.0093[a]	1.0000	< 0.00001[a]	

[a]$P < 0.05$.

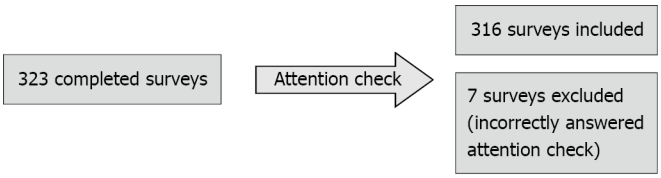

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Figure 1 Study participants. A total of 323 participants completed the survey *via* Amazon Mechanical Turk. 7 participants were excluded because they failed the attention check question, leaving 316 participants who were included in the study.

may be diminished[19]. The physician can observe the phenomena described by the patient or feel the catching at the level of the A1 pulley or detect crepitus at this level. The patient often reports pain with palpation at the A1 pulley. Subluxation of the extensor tendon at the dorsal aspect of the metacarpophalangeal (MCP) joint secondary to a sagittal band rupture and a locked metacarpal phalangeal joint are rare but are occasionally confused with trigger finger. The pathophysiology of trigger finger is felt to be the result of thickening and narrowing of the tendon sheath–and not in the tendon itself or tenosynovium[19,20]. This size mismatch occurs at the level of the A1 pulley. Thickening at the A1 pulley restricts motion of the flexor tendon.

No standard protocol exists for treatment of trigger finger[21,22]. Treatment options include splinting, corticosteroid injection and surgery[23]. In addition to these interventions, observation (no treatment) is an option. The reported success rates for each option vary considerably. There are only a few reports on the natural history of untreated trigger finger. McKee *et al*[9], in 2018, reported the results of 343 patients with a diagnosis of trigger finger who received no treatment, 178 patients (52%) had complete spontaneous resolution. Of the 178 patients who had complete spontaneous resolution, 50% did so within 8 mo of initial consultation and 90% had complete resolution within one year[9]. The

authors hypothesized that improvement resulted from "some remodeling over time of the pulley" and decreased inflammation from rest and lifestyle modification. Schofield and Citron reported on the natural history of adult trigger thumb in 30 patients enrolled in a prospective study[24]. (According to the authors) five patients insisted on treatment, triggering resolved in the remaining patients without treatment after an average of 6-8 mo, within a range of 2-15 mo.

Not all patients are willing to wait but would like to "do something." For those who want to do something but are not ready for surgery, splinting and cortisone injections are options. Several splinting designs and techniques have been described[25-29]. Colbourn *et al*[28] reported improvement in 28 patients who wore a custom-made thermoplastic splint which limited motion at the MCP joint for 6 wk [28]. Rodgers *et al*[25] reported the results of splinting the distal interphalangeal (DIP) joint in meat packing plant laborers, some of whom also were given a cortisone injection. At a mean one year follow up 81% were treated successfully[25]. Tarbhai *et al*[27] compared splinting of the MCP joint *vs* splinting of the DIP joint in a prospective randomized study of 30 subjects[27]. Success was defined as complete or partial relief of triggering. Success rate with splinting of the DIP joint was 47%, a lower success rate than reported by Rodgers *et al*[25]. Success rate with blocking splint of the MCP joint was 77%. Teo *et al* [26] compared splinting of the MCP joint with splinting of the proximal interphalangeal (PIP) joint. Both splints were effective in reducing pain and disability and improving triggering symptoms, but the PIP splint was more effective[26]. Collectively, splinting of the affected digit, in various forms, appears to be a viable treatment option.

Corticosteroid injection into the flexor tendon sheath was first described by Howard *et al*[30] in 1953. Reported success rates vary[2]. Wojahn *et al*[11] investigated the long-term effectiveness of a single corticosteroid injection for trigger finger in 366 patients with a minimum 5 year follow up[11]. 45% of patients had long term success following one injection. Most failures (84%) occurred within the first two years following injection. Dala-Ali *et al*[31] reported results in patients who received up to 3 cortisone injections[31]. Studying 90 trigger digits in 61 patients the reported a 34% success rate with one injection, 63% success rate with 2 injections and 66% success rate with 3 injections. Dardas *et al*[12] investigated the effectiveness of repeat cortisone injections for trigger fingers[12]. Second injections provided long term success in 39% of trigger fingers and third injections provided a similar 39% success rate. The authors reported a hypothetical success rate of 82% after 3 injections. Rozental *et al*[20] looked at prognostic indicators of recurrence following cortisone injection[20]. Insulin dependent diabetes, younger age and involvement of multiple digits were associated with higher rate of treatment failure. Grandizio *et al*[32] also noted that younger age was a risk factor for persistent triggering after a cortisone injection[32]. However, in their study diabetes was not a risk factor for failure.

Many patients, when given the option of cortisone injection, want to know how soon they might see improvement. Seigerman *et al*[33] investigated time to improvement after cortisone injection in a study involving 452 patients and found that most patients experience relief of pain and triggering at 3 wk following cortisone injection[33]. They reported that the majority of patients had some pain relief within the first week after cortisone injection. Improvement in trigger lagged behind pain relief.

When non-operative modalities fail, surgery is an option. While percutaneous procedures and endoscopic surgery are options, the most common surgical intervention is release of the A1 pulley *via* an open incision. The success rate is high, with success rates reported at > 95%, and the procedure is considered low risk but complications can and do occur[34]. Everding *et al*[23] in a retrospective review of 795 digits release in 543 patients reported complications in 12%[23]. Most common complications were persistent pain, swelling, persistent or recurrent triggering. Reoperation rate was 2.4% including revision release and investigation and debridement. The rate of infection following trigger finger release is low but increased rate of infection is reported if surgery is performed within 90 d of cortisone injection[35,36].

Percutaneous release of the first annular pulley is a procedure that has been increasing in popularity. The biggest advantage of this procedure is its less invasive nature and lower cost compared to open release. The biggest disadvantage is the lower success rate, reported at around 94%, often due to incomplete release of the annular pulley[37].

Augmentation of percutaneous release with sonographic guidance is a recent technique that has increases the success rate of percutaneous release. One factor limiting wider acceptance of sonographic guidance is the high cost[37]. More research is needed to assess the cost effectiveness of sonographic guidance.

Recommendations for a treatment algorithm are reported in the literature, but consensus lacks. Amirfeyz *et al*[38] stated that there was weak evidence to support use of a splint and that a single cortisone injection may be offered as initial treatment, but surgery should be next if injection fails[38].

Cost of treatment can affect recommendations that a provider makes. Zhuang *et al*[39] evaluated cost effectiveness of cortisone injections *vs* open trigger finger release and reported that, from a healthcare payer perspective, offering 3 cortisone injections before surgery is a cost-effective strategy[39]. Kerrigan and Stanwix examined cost of treatment and concluded that the least costly treatment would be 2 injections before surgery[40].

The published papers that review results of various treatment options, and studies that examine costs associated with treatment for trigger finger, often fail to consider the patient's perspective. In our investigation participants were asked to assume they were diagnosed as having a trigger finger. They were

given a hyperlink that allowed them to see an 8 s video which demonstrated a trigger finger. They were then presented with 4 options for treatment: Observation, use of a splint, cortisone injection and surgery. A plurality (37%) chose observation as their first method of treatment and 27% chose splinting as their choice. Thus, more than half selected a non-invasive modality as their first choice. Analysis revealed that patients do have a preference between treatment options, except when choosing between observation and splinting.

This contrasts most current recommendations on treatment which recommend corticosteroid injection as a first line treatment. This information can inform physicians when seeing a patient who presents with a trigger finger that there may be a reluctance by the patient to undergo an invasive intervention (cortisone injection or surgery). The job of the treating physician is not to persuade the patient to pursue a particular treatment modality but rather to educate, to explain, to discuss, to answer questions, and to listen and respond. The results of this study provide the treating physician with a very general idea of what patients may want when learning they have a trigger finger.

Limitations

The use of an online survey inherently limits patient knowledge on treatment options, including duration of treatment, success rates, and complications. All of these factors are likely to affect a patient's selection of treatment.

No demographics were collected from the participants. It has previously been shown that the AMT worker population is representative of the general United States internet population is similar studies[6-8,41,42]. However, the internet population may not be the same as the population treated for trigger finger.

It was unknown if any study participants previously had trigger finger. They were given a prompt and information to review as well as a video of a trigger finger. An individual's perspective on treatment may change if they experience the symptoms of a disorder, as opposed to simply reading about it.

The severity of trigger finger symptoms varies widely. Our survey did not indicate to participants the severity of their symptoms which may affect the treatment they chose to pursue.

The inclusion of a pay-per-response model could lead to a selection bias as individuals may have not viewed our particular pay as high enough to proceed with the survey.

Participants were not offered an option for percutaneous A1 pulley release. Given the less invasive nature of this procedure compared to open release, patients may be more likely to choose this option.

CONCLUSION

The practice of shared decision making with patients is imperative to providing the best care possible. The results from this study, especially the preference for less invasive treatment, may help providers better frame discussion around treatment options of trigger fingers. This in turn, may increase patient satisfaction in the treatment of trigger finger.

ARTICLE HIGHLIGHTS

Research background

Trigger finger is one of the most common hand disorders that can lead to debilitating symptoms.

Research motivation

To provide increased insight to providers treating patients with trigger finger to better allow shared decision making.

Research objectives

To determine patient preference for the treatment of trigger finger.

Research methods

An online survey was perfomed using a crowdsourcing website. Participants were led through scenarios regarding the symptoms of trigger finger and treatment options. They were then asked questions regarding their preferred treatment.

Research results

Of 316 participants results were included. 37% of the participants chose observation as their first choice, 27% splinting, 19% corticosteroid injection, and 16% surgery. The mean rank of each treatment option was statistically different from the others, except for observation and splinting.

Research conclusions

Patients may have more of a preference for less invasive treatment of trigger finger. This information can help providers better frame discussions around shared decision making with patients.

Research perspectives

Further research is needed to better understand patient factors that effect treatment choice.

FOOTNOTES

Author contributions: Blough C and Kuschner S designed the research study; Blough C and Najdawi J performed the research study and analyzed the data; Blough C and Kuschner S prepared the manuscript; all authors have read and approve the final manuscript.

Institutional review board statement: This study was exempt from IRB review as described in 45 CFR part 46. Participants were made aware of the voluntary nature of this survey and the data was collected in a way that the subjects' identity could not be ascertained by the researches.

Informed consent statement: An online, survey based, descriptive study was performed through the use of a crowdsourcing website, Amazon Mechanical Turk (AMT). Participants for this study were randomly recruited through AMT.

Conflict-of-interest statement: All the authors report no relevant conflicts of interest for this article.

Data sharing statement: No additional data are available.

STROBE statement: The authors have read the STROBE guidelines, and the manuscript was prepared and revised according to the STROBE guidelines.

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