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Prolotherapy: Practices, Experiences and Observations Concerning Adverse Effects of Physician in Turkey

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Background: Prolotherapy is a newly emerging field in Turkey and the aim of this study was survey physicians involved in prolotherapy concerning their practices, experiences and observations concerning adverse effects during prolotherapy administration in Turkey.

Materials and Methods: The study was cross-sectional and observational in nature. A purposeful sample of physicians (n:14), who practiced prolotherapy were invited to participate in this study. A questionnaire consisting of items on socio-demographics, training, and practice of prolotherapy was applied to these volunteering practitioners, who gave verbal consent before participating. Data were analyzed with descriptive analysis.

Results: The participants mainly consisted of men (85.7%). All participants (100%) stated that prolotherapy was safe. They have been practicing prolotherapy since 3.6 years. Problems like pain (100%), ecchymosis (64.3%), numbness (28.6%), and edema (14.3%) were the most common observed problems at the site of injection. Four (28.6%) participants observed at least one adverse incident after a prolotherapy injection. Two (14.3%) stated that their patient was hospitalized due to this incident. Their reasons for hospitalization were pneumothorax and anaphylactic shock (n:1; 7.1%). None (100%) was used for malpractice due to these adverse effects.

Conclusion: The procedure-related risks should not be underestimated. Prolotherapy seems to be safe medical procedure in the extremities. Special caution should be given to areas like the thorax and spine. Prolotherapy performing physicians should be prepared for anaphylaxis or bleeding-related medical adverse conditions

Keywords: Integrative medicine, complementary medicine, prolotherapy, injections, pain, Turkey

Introduction

Cervical and low back pains are the most frequent musculoskeletal symptoms in adult patients and a quarter of these are aged 65 and older. These complaints of the aging population are a burden to the patients and for the health system (1). An estimation of the utilization of complementary like chiropractice, osteopathy or prolotherapy, which might be high if provided is not known well. Other areas, which are the reason of frequent pain encounters, are upper and lower extremities. Joint pain and especially problems around the knee and shoulder. The prevalence increases here with age. These pains are also a frequent reason for disability and loss of functionality in the sensory,

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emotional, mental, professional, social, and household domains (1). Osteoarthritis is a common reason for pain related to medical encounters. It is a chronic degenerative joint condition, which limits the movement of joints and represents stiffness. Various degrees of structural and anatomic derangements exist in this degenerative process. Besides first-line medical and exercise therapies, injection therapies are commonly applied to this medical problem (2).

Prolotherapy is accepted as one of injection therapies, which has been applied for 80 years to treat the laxity of ligamentous tissue and osteoarthritis-relatedmusculoskeletal condition. New evidence and long-lasting experience in this field supported prolotherapy as a method to manage osteoarthritis, musculoskeletal pain, joint pain, and laxity, chronic low back pain, lateral epicondyle, overuse tendinopathy, and other related conditions safely (1,3,4). It is a nonsurgical injection technique, where irritant solutions are injected to sensitive anatomic areas. The aim is to benefit of the regenerative effects of the small number of irritants on degenerated or soft tissues and locations, like joints, ligaments, and surrounding joint tissues. This intervention promotes growth cells and tissues and reduces laxity by scarring ligaments adjacent to the area of pathology (1, 2, 4, 5).

Anecdotal literature mentions prolotherapy as a safe method. Several studies, which observed outcomes of thousands of patients have not reported any prolotherapy related severe adverse effect like death, hospitalization, disability, etc. the concern that these severe cases might be underreported, lead to a survey in prolotherapy practicing physicians, which has been published in 2006 (6). Besides another study, which was published by Dorman in 1993, no other study is available in the literature. Dorman investigated data of almost 500000 patients, who underwent prolotherapy treatment (7). We share the concerns of both authors. Prolotherapy is a newly emerging field in Turkey, and the aim of this study surveyed physicians involved in prolotherapy concerning their practices, experiences, and observations concerning adverse effects during prolotherapy administration in Turkey.

Materials and Methods

The study was a cross-sectional observational. A purposeful sample of physicians (n: 14), who practiced prolotherapy was invited to being a participate. A questionnaire consisting of items on socio-demographics, training, and practice of prolotherapy was applied to volunteering practitioners, who gave verbal consent before participating. The questionnaire consisted of 25 items (10 open and 15 closed-ended questions). The draft form of this questionnaire was piloted in five physicians, and retrieved answers were not added to the data. Data of were analyzed with descriptive analysis.

Results

The participants were women (n:2, 14.3%) and 12 (85.7%) were men. Their age were 38.8 (SD: 4.7; min-max:31-50; n:14) and marital status were married (11; 78.6%) and single (n:3; 21.4%). The field of medical specialization was as follows: anesthesia (n:5; 35.7%), physical medicine and rehabilitation (n:5;35.7%), internal medicine (n:3; 21.4%), and sports health (n:1; 7.1%). They had professional experience of 12.6 (SD: 3.82, min-max:6-20, n:14) years. They were trained in prolotherapy in the Turkish Prolotherapy Clinic, Istanbul (n:7; 50%) and in a private clinic (n:7; 50%). All participants (n: 14; 100%) mentioned that prolotherapy is safe.

They were practicing prolotherapy since 3.6 (SD:1.7; min-max:2-8; n:14) years. They reported to have managed median 300 (min-max:100-3000; n:14) patients with prolotherapy in the past and median 175 (min-max:20-1000; n:14). The median age of their patients was reported as 50 (min-max:40-60; n:14) and their gender were mainly women (n:10, 71.4%) and lesser men (n:2, 14.3%) (n:2, 14.3% missing data). A median of four (min-max:2-6; n:14) encounters have been made to manage the problems of the patients. The median number of injections, which were applied during these encounters was 20 (min-max:3-50; n:14).

The most common anatomic areas, where injections for the prolotherapy reasons were applied as follows: shoulder (n:10;71.4%), elbow (n:8, 57.1%), lower back (n:7, 50%), hip (n:4, 28.6%), ankle and foot (n:3, 21.4%), back (n:2, 14.3%), and head-neck and wrist region (n:1, 7.1%). The most common solutions for injections during prolotherapy were as follows: lidocaine (n:13; 92.9%), dextrose 15%(n:13, 92.9%), dextrose 10% (n:8; 57.1%), dextrose 20% (n:5; 35.7%), dextrose 5% and 30% (n:3; 21.4%), and Marcaine or prilocaine (n:1, 7.1%). Additionally, nine participants (64.3%) used local anesthetics and five (35.7%) applied sedation before prolotherapy. Eighth (57.1%) used oktesol (0.1% Octenidine Hydrochloride+ 2% Phenoxyethanol) and six (42.9%) betadine (povidone-iodine) as a skin antiseptic.

Most participants (n:13; 92.9%) stated that they felt, that prolotherapy was safe for their patients. One (7.1%) was undecided concerning this question. Problems like pain (n:14; 100%; n:14), ecchymosis (n:9; 64.3%; n:14), numbness (n:4; 28.6%; n:14), and edema (n:2; 14.3%; n:14) were the most common observed problems at the site of injection. Anatomical regions, where these problems were seen were as follows: neck or knee (n:5; 35.7%) and head, shoulder, chest, ankle or foot (n:1; 7.1%). Four (28.6%; n:13; 1 answer missing) participants observed at least one adverse incident after prolotherapy injection. Two (14.3%; n:13, 1 answer missing) stated that their patient was hospitalized due to this incident. Their reasons for hospitalization was pneumothorax and anaphylactic shock (n:1; 7.1%). None (n:12;100%; n:12, two answers missing) were used for malpractice due to these adverse effects.

Discussion

The participants were men, and they were mainly in their middle ages. Most were trained in anesthesia (n:5; 35.7%) and physical medicine and rehabilitation, and professional experience mainly over ten years. All believed that prolo therapy is a safe practice. Even a relatively new practice in Turkey, the median duration of prolotherapy experience was almost four years. The number of patients managed by the participants is also quite astonishing (100-3000 cases in the past and 20-1000 in the last year per physician). Their patients were at their fifties and mainly women.

Prolotherapy requires, because of the applied technique, training in most countries. This is also the case in Turkey. Therefore, the number is restricted, but fortunately, due to the promotion of Turkish Ministry of Health, the number needed to practice prolotherapy safely will increase soon (3). According to a study performed by Dagenais et al among 171 participants of their study ninety-eight percent had a medical degree, 83% had a board certification, had a median of 10 years of professional experience, treated a median of 500 patients, and gave a median of 2000

treatments (6). These findings are comparable to our study. The precedence of anesthetists and physical medicine and rehabilitation specialists in our study is due to the traditionally assigned injection skills for these disciplines. Prolotherapy, according to regulation is a privilege awarded only to medical doctors in Turkey. Hence, participants were doctors.

The treatment is based on injections over a 2-6 weeks period (8). Patients with moderate-severe knee osteoarthritis had 4.3±0.7 times injections during their 17-week lasting therapy sessions (9). The participants saw their patients approximately four times, and the median number of injections applied was 20 in our study. Dextrose is the most commonly used proliferant nowadays, which is water soluble, has proliferative properties, and be applied safely. Different concentrations of dextrose are used during prolotherapy. The higher the concentration, the more the cells at injection site tend to dehydrate and activate cell and tissue repair, which in turn will facilitate the repair of structures that stabilize the joints and surrounding tissues (1, 10). The most common solutions for injections during prolotherapy were as follows: lidocaine (n:13; 93%), dextrose 15% (n:13; 93%), dextrose 10% (n:8; 57.1%), dextrose 20% (n:5; 35%), dextrose 5% and 30% (n:3;21.4%), marcaine or prilocaine (n:1; 7%).

Cervical and low back, upper and lower extremity, knee and shoulder pains are the most frequently seen in practice (1). In our study the most common anatomic areas, where injections for prolotherapy reasons were applied, were as follows: shoulder (n:10; 71.4%), elbow (n:8; 57%), lower back (n:7; 50%), hip (n:4; 28.6%), ankle and foot (n:3; 21.4%), back (n:2; 14.3%), and head-neck and wrist region (n:1, 7.1%). Even in a study, the majority (87%) of participants did not apply any sedation before prolotherapy and believed to reduce risk complications (6). In our study, nine participants (64.3%) used local anesthetics, and five (35.7%) applied sedation before prolotherapy. The reason might also be a cultural one, and the patient might have lower pain thresholds and request sedation before prolotherapy.

In one survey, nearly all participants applied common skin antiseptics before prolotherapy with the aim to prevent injection-related infection (6). This was the case in all respondents in our study. Eight (57.1%) used oktesol (0.1% Octenidine Hydrochloride+2%Phenoxyethanol) and six (42.9%) betadine (povidone-iodine) as a skin antiseptic. Dagenais etal,reported that pain, stiffness, and bruising were the most common side effects after prolotherapy injections (6). Another study observed mild-moderate pain after the injection. Some patients experienced bruising after saline or dextrose injections. Patients did not complain of any other side or adverse effect (11). Additionally, mild bleeding, sense of fullness, and numbness are described at the injection site immediately after injection, as well. Within 72 hours, a pain flare is mostly observed after knee injections. Paracetamol is used as a first-line analgesic, but very rarely a narcotic agent necessary. Pain is expected to decrease within 5-7 days after injections.

The patient can return to daily activities after injections (8). Further, possible side effects might be a headache, nausea, diarrhea, and minor allergic reaction to the injected agent (5, 6). Effects like bruising are seen as expected minimal clinical side effects (4). In one study, a moderate degree of evidence has been found for prolotherapy administered to the knee with osteoarthritis (12).

Prolotherapy has been recommended as a safe method for diverse axial and upper limb problems (13).Especially, dextrose prolotherapy is expected as a safe therapy with less adverse events (1). In our study, most participants (n:13; 92.9%) stated that they felt, that prolotherapy was safe for their patients. One (7.1%) was undecided concerning the question. Side effects like pain (n:14; 100%; n:14), ecchymosis (n:9; 64.3%; n:14), numbness (n:4; 28.6%; n:14), and stiffness (n:2; 14.3%; n:14) were mainly observed problems at the site of injection. Anatomical regions, where these problems were seen were as follows: neck or knee (n:5; 35.7%) and head, shoulder, chest, ankle or foot (n:1; 7.1%).

Dorman reported in his retrospective study that less adverse effects were seen after prolotherapy injections. These adverse effects were mainly in areas outside of the extremities. These were commonly pneumothorax, allergic reactions, and other reasons for hospitalization. These findings might be biased due to recall bias, but some prolotherapists used sclerosants, which were no longer in use (i.e., zinc sulfate, etc.) (7). Dagenais et al. reported 472 adverse effects in their survey-based study. Sixty-nine needed hospitalization, and five had a severe nerve injury. Most adverse effects developed during injection (i.e., spinal headache, pneumo thorax, transient systemic reactions, nerve injuries, bleeding, mild spinal injury, and disk injury (n:2) (6). However, in seven RCTs (393 participants, aged 40-75 years), who were followed-up 12 weeks to 12 months covering osteoarthritis of the knee (n: 5), first carpometa carpal joint (n: 1) and finger joints (n: 1) and used mostly dextrose no serious adverse events have been observed (14). Dextrose prolotherapy should be accepted as a safe therapy with few adverse events reported. Dextrose itself is a hugely safe agent for intravenous administration. No adverse events have been seen for 25% intravenous dextrose solution in the last 60 years (1). In our study, four (28.6%; n:13, 1 answer missing) participants observed at least one adverse incident after prolotherapy injection. Two (14.3%; n:13; 1 answer missing) stated that their patient was hospitalized due to this incident. Their reasons for hospitalization was pneumothorax and anaphylactic shock (n:1; 7.1%).Respondents of one study reported malpractice claims of 13 patients due to back and neck pain prolo therapy. Remaining 157 did not mention any problem due to prolotherapy treatment (6). Our study participants faced no problem with their practice, and no one (n:12; 100%; n:12, two answers missing) were sued for malpractice due to adverse effects caused by prolotherapy.

Conclusion

Prolotherapy should be performed by trained physicians. The procedure-related risks should not be underestimated, but the expected health-benefits of prolotherapy should be accepted. Prolotherapy seems to be a safe medical procedure in the extremities. Particular caution should be given to areas like the thorax and spine. Prolotherapy performing physicians and practices should be ready for anaphylaxis- or bleeding-related medical adverse events.

Conflict of Interests

None of the authors has a conflict of interest with the submission.

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