Review of Literature: Risk Factors for Prolonged Opioid Usage in Patients with Low Back Pain in the Civilian and Military Population.

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Introduction

The opioid epidemic is growing without hesitation, fueled by the plague of chronic pain and the over-prescription of medications in attempt to treat it.[1] Low back pain is the most common pain condition to receive an opiate prescription. These prescriptions come most often from a primary care physician, contrary to the clinical practice guidelines (CPGs) and the evidence of potential harm and ineffectiveness of these medications on the condition.[2] In attempt to combat the opioid crisis, the CDC has developed and updated guidelines for prescriptions since the exponential increase of these in 1990. However, these have remained controversial and not consistently adhered to due in part to the lack of consequences for noncompliance.[1]

This review of literature includes completed studies regarding the risk factors for prolonged opiate usage in patients with low back pain. The purpose is to highlight the predominant risk factors to better educate clinicians and patients on the potential dangers of opioid usage to manage low back pain, to provide information on more effective treatment strategies and interventions, and to discuss the outcomes of opioid use in those with low back pain. Additionally, discussion of physical therapy as an alternative intervention and the outcomes occurring with this non-pharmacological approach compared to opiate prescriptions is included.

Low Back Pain Incidence

Chronic pain, defined by pain lasting longer than three months, is one of the most common conditions leading to a medical visit in the United States.[3,4] Under the umbrella of chronic pain exists low back pain, a condition affecting 50 million adults in the United States.[5]

Not only does LBP affect the sensory system, it is also a contributor to significant emotional distress in many patients.[6] In addition, LBP causes significant amounts of disability leading to upwards of 149 million missed days of work annually in the United States.[7] There is also an increased risk of suicide in those with chronic LBP, defined as low back pain lasting longer than three months.[6] Studies have identified professions at great risk of developing low back pain, including driving professionals (taxi, bus, truck, etc.), heavy machinery operators, pilots, and construction workers, to name a few. The physical nature of these professions contributes to the development of low back pain as well as psychosocial health in the work environment. Poor job satisfaction, monotony, stress, and work relations can all contribute to the onset and chronicity of this condition.[7]

In the military setting, LBP is a common ailment for both active duty servicemembers and retired veterans.[7,8] In 2006, LBP was the number one reason for medical visits in the United States Armed Forces, with upwards of 7.5% of all medical visits being attributed to the condition. Additionally, in both the Iraq and Afghanistan conflicts, 17%-18% of non-battle injury evacuations were due to LBP.[9] Individuals entering their military career with a history of chronic low back pain are at a 10x greater risk for developing the condition throughout their service.[10]

The most common diagnosis made in military facilities resulting in an opioid prescription was lumbago, or mechanical low back pain.[11] Conditions of the spine remained at the top of the list for both the military and civilian populations, further demonstrating the large number of possibilities for prescription.[11] Included are military veterans, with this cohort having greater amounts of chronic pain than that of the general population.[12]

Military Population and Common Comorbidities

As discussed previously, there is a high incidence of low back pain in both the active duty military and veteran populations.[11,12] Within this population, there are also various comorbidities that commonly affect individuals, potentially predisposing those involved to subsequent conditions. Examples of these include depression, anxiety, post-traumatic stress disorder (PTSD), traumatic brain injury (TBI), and sleep disorders.[13] Under the umbrella of sleep disorders are sleep apnea, insomnia, behaviorally induced insufficient sleep syndrome, and snoring. Studies have shown that many of these sleep disturbances may be attributed to the previously mentioned psychosocial conditions of anxiety, depression, or PTSD or the neurological injury of a TBI.[13] Also contributing to sleep disorders, specifically insomnia, were those affected by pain syndromes. The study by Mysliwiec et al[13] found that 24.7% of their 725 person sample were taking medications for pain. Opioids were among the medications being taken for pain management, and side effects can include sleep disruptions and sleep apnea.[13]

The incidence of TBI, specifically mild TBI, is high in military service members compared to their civilian counterparts. Many of these individuals recover within months, however, some are plagued with the injury for much longer.[14] Complicating things further is the prevalence of PTSD in the military population, a condition that has similar signs and symptoms to mild TBI and post-concussive syndrome, deeming it difficult to differentiate between the two conditions to achieve a diagnosis.[14] The study by Dretsch et al[14] showed that those afflicted by either mild TBI or PTSD had greater occurrences of anxiety, depression, traumatic stress, and post-concussive symptoms, potentially putting this cohort at greater risk for opioid dependency, as discussed later.

Clinical practice guidelines warn against opiate prescriptions for individuals with a history of TBI and chronic pain due to the risk of adverse outcomes; however, soldiers in Iraq and Afghanistan between October, 2007 and March, 2015 with a history of moderate to severe TBI had a significantly greater risk of receiving opioid therapy. Further compounding the risk were the diagnoses of PTSD and Depression in this population.[15] Other confounders of this treatment regimen have been identified as a younger age (18-24), being a race other than African American, serving in the Army (as opposed to other branches), active duty, and serving multiple deployments.[15]

Opioid Naïve

Although it is not the intention of the prescribing healthcare professional, short-term opioid use can often turn into prolonged use without hesitation. Primary care physicians are the leading prescribers of opioids in the United States.[2] According to Jeffery et al[16], 1.5%-27% of those that are opioid naïve, defined as having no opioid prescriptions filled in the previous six months, continue use of opioids past their initial prescription, exhibiting dependency. Through a search of insurance claims of 707 opioid-naïve individuals with low back pain seeking treatment, 24.3% became long-term users at follow-up in one year after initial prescription.[4] Contributing to these odds are older age, public insurance, smoking, and anxiety.[4] Monitoring and modification of these factors as well as the incorporation of physical therapy intervention can decrease this risk.[4]

Risk Factors Leading to Prolonged Opioid Use

Many LBP patients develop poor behaviors and habits to decrease the burden of the condition, including long-term opioid use. With long-term and high-dose use, patients are at risk

for opioid hyperalgesia, sleep apnea, hypogonadism, immunosuppression, fractures, bowel obstruction, overdose, opioid use disorder, and death.[17] This also can contribute to chronicity of pain due to changes in the cortical structure and function.[6] Sun et al[18] identified age (>50), gender (male), previous medication use (benzodiazepines, antidepressants, and antipsychotics), and comorbidities (depression, alcohol abuse, psychosis, or drug abuse) as the main risk factors for opioid dependency. Wasan et al[19] described the effect of negative emotions and thoughts (negative affect) on pain leading to decreased efficacy of opioid analgesia. Negative affect includes depression, anxiety, and catastrophizing, highly common comorbidities in individuals with chronic pain. High amounts of negative affect in combination with low back pain poses a significant risk for prolonged opioid use. In addition, those on public insurance and smokers have a heightened risk for long-term opioid use.[4] A study by Smith et al[20], showed that individuals with depressive symptoms and low back pain were greater than two times more likely to receive an opioid prescription, and further received twice the dosage of opioids per year when compared to those without depression.

PTSD is also a widespread condition in the civilian population and has been identified as a co-occurring condition with substance use disorders, increasing the risk for poor outcomes. A recent study found the prevalence of this combination of conditions to be 6.6% but this study had significant participation limitations due to the method of recruitment of subjects. The study by Meier et al[21] found that there was an increased risk for severe PTSD symptoms with patients with prescription opioid misuse, further exacerbating the problem. Interestingly, this study identified females as more likely to develop opioid use issues than males. Similar to previous research, the younger population (18-34) was more impacted by this condition.[21]

Opioid prescriptions resulting from an emergency department visit are more likely to follow the recommended dosages, formulations, and days' supply, following the Centers for Disease Control and Prevention (CDC) guidelines, decreasing the risk for long-term use. Those at greater risk for long-term use include disabled Medicare beneficiaries seeking treatment from their primary care physician.[4,16] Interestingly, individuals living in a household with a household member taking prescribed opioid medications are at a greater risk for future opioid use, indicating that access to medication as well as prescribing patterns play a role in the opioid crisis.[22] Additional risk factors include tobacco use, prior opioid use, counts of prior opioid prescriptions, total outpatient encounters per month, and chronic pain.[23]

Opioid Use Outcomes on Low Back Pain

In cases of spine surgery, pre-operative opioid use leads post-operative to increases in Oswestry Disability Index Score (ODI) and decreases in quality of life measures such as the SF-12 and the EQ-5D. With each 10mg increase in dosage, the scores on the aforementioned measures are significantly affected. Preoperative opioid use, smoking, outcome measure scores (ODI, SF-12, Zung Depression Scale, and Modified Somatic Perception Questionnaire), and Diabetes were all predictors for poorer outcomes post-surgery.[24]

Patients undergoing spine surgery, such as posterior lumbar fusion (PLF) for degenerative conditions of the spine, are often prescribed opioids prior to the procedure. In a sample of 24,610 patients with a scheduled PLF, 22.3% had documented opioid use greater than 6 months prior to the procedure and 87.4% had long-term use post-operatively. These patients were at a greater risk for wound complications, pain diagnoses, readmission, ED visits, and prolonged use. This evidence demonstrates that pre-operative opioid use is a risk factor for negative outcomes after a PLF.[25]

Physical Therapy Outcomes on Low Back Pain

Physical therapy intervention has been demonstrated as successful and cost-effective in the treatment of low back pain and associated disability with the condition.[26] Ross[27] studied the efficacy of this intervention in the military population, finding that ODI scores were significantly decreased after non-standardized physical therapy treatment episodes. Inclusion of short-term spinal manipulation in conjunction with a supervised exercise program for the management of chronic low back pain was adopted as the recommended clinical guidelines for Europe in 2010.[28]

A study of 454 patients with Medicaid seeking treatment for low back pain between January 1, 2012 and December 31, 2013 found that 47% of these individuals received a referral for physical therapy. Those more likely to receive these referrals were of younger age, had imaging done, or had a prescription for either a muscle relaxer or non-steroidal anti-inflammatory. Conversely, tobacco use, chronic pain, depression, or multi-morbidity decreased the likelihood of a physical therapy referral or utilization of the service. Additionally, those that received a physical therapy referral and subsequently participated in therapy were less likely to receive a prescription for opioids at their follow-up appointment.[29]

According to the evidence, not only is physical therapy an effective treatment option for the management of low back pain[26–28,30], it also decreases the risk for long-term opioid use.[4,16,24] Included in the scope of physical therapy practice are intervention methods that have contributed to positive patient outcomes in pain and disability measures, such as kinesiotaping, spinal manipulation, and stabilization exercises.[26,27,30,31]

Prognostic Factors

Duration of pain, involvement of the lower extremities, and fear-avoidance beliefs are evidence-based predictors for prolonged, chronic low back pain. Females demonstrated better improvement in pain and disability with stabilization exercises, while men had a more negative outcome with these activities.[26] Another prognostic factor is that of negative affect, with individuals exhibiting this syndrome experiencing poor treatment outcomes with opioid use.[19]

Physical inactivity is a predictor for future low back pain. This, among other reasons, contributes to the greater incidence of future low back pain once initially diagnosed with the condition. Conversely, education on the condition, including preventative measures for future occurrences, as well as exercise are important in the prevention of the condition.[10] Referring back to the risks of opioid prescription and prognoses, surgical intervention often leads to chronic use, therefore resulting in greater negative outcomes.[18]

Henschke et al[23] discuss the importance of advice in the management and prognoses of low back pain. Their cohort study highlights the evidence promoting reassuring patients that they will have a positive outcome, specifically educating them on the likelihood of recovery in six weeks. Included within this study are the "yellow flags" or negative prognostic indicators such as fear of re-injury, involvement of the lower extremity, and also low job satisfaction. This study also identified seven variables of prognoses including age, compensation cases of low back pain, duration of the episode, risk of persistence, feelings of depression, days of decreased activity, and intensity of pain.[8]

Conclusion

Current evidence points to the inefficacy of opioid medication for the treatment of acute low back pain in both the civilian and military populations.[2,3,4,11,21] Risk factors for prolonged opioid use include mental health diagnoses (depression, anxiety, PTSD), sleep disturbances, TBI, chronic pain, previous opioid use, other substance use, and use of anti-psychotic medications.[4,6,16-23] Physical therapy has been shown to be an effective intervention to treat low back pain, as well as to decrease the financial burden on the individual and the healthcare system as whole.[4,19,20,21,22] It is necessary that we as healthcare professionals synthesize and apply the evidence in order to provide the best care for our patients while minimizing the risk of negative outcomes.

Resources

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