

CONCEPT ANALYSIS

Chronic unexplained orchialgia: a concept analysis

Susanne A. Quallich & Cynthia Arslanian-Engoren

Accepted for publication 23 November 2013

Correspondence to S.A. Quallich:
e-mail: quallich@umich.edu

Susanne A. Quallich ANP-BC NP-C CUNP
PhD Student, Andology Nurse Practitioner
University of Michigan School of Nursing,
Ann Arbor, Michigan, USA
and Department of Urology, University of
Michigan Medical Center, Ann Arbor,
Michigan, USA

Cynthia Arslanian-Engoren PhD RN FAAN
Associate Professor
University of Michigan School of Nursing,
Ann Arbor, Michigan, USA

QUALLICH S.A. & ARSLANIAN-ENGOREN C. (2014) Chronic unexplained orchialgia: a concept analysis. *Journal of Advanced Nursing* 70(8), 1717–1726. doi: 10.1111/jan.12340

Abstract

Aims. To conduct an analysis of the concept of chronic unexplained orchialgia.

Background. Chronic unexplained orchialgia is a concept unique to men's health; however, clarity is lacking regarding the precise meaning of the key attributes of this important concept.

Design. Walker and Avant's framework was used to guide this concept analysis.

Data sources. Literature sources included bibliographic databases.

Review methods. Literature published in English from January 1970 to December 31, 2012 was reviewed. Thematic analysis identified critical attributes, antecedents and consequences of the concept.

Results. Based on the analysis, a contemporary definition for chronic unexplained orchialgia is proposed, rooted in the concept of chronic pain. This definition is based on the concept analysis and the defining attributes that were identified in the literature. Chronic unexplained orchialgia is a subjective negative experience of adult men, perceived as intermittent or continuous pain of variable intensity, present at least three months, localizing to the testis(es) in the absence of objective organic findings and that interferes with quality of life.

Conclusion. This analysis provides a precise definition for chronic unexplained orchialgia and distinguishes it from other similar terms. This concept analysis provides conceptual clarity that can guide understanding and development of a conceptual framework, middle range theory, or situation-specific theory. Further exploration of this concept is recommended to uncover the influence of social, sexual and cultural factors.

Keywords: chronic orchialgia, chronic testicular pain, concept analysis, nurse practitioners, nursing, urology

Introduction

Chronic pain is a complex and difficult clinical symptom to understand, because of the subjective and personal nature

of the complaint and the influence of an individual's perception and past experiences. This creates challenges in building conceptual and operational definitions, which is

[Correction added on 20 January 2014, after first online publication: The affiliation of the author, Cynthia Arslanian-Engoren, has been corrected from 'Department of Urology, University of Michigan Medical Center' to 'University of Michigan School of Nursing']

Why is this research or review needed?

- The concept of chronic unexplained orchialgia has been poorly defined.
- Chronic unexplained orchialgia is an understudied and underdescribed chronic pain condition.
- Multiple terms have been used interchangeably to describe chronic unexplained orchialgia.

What are the key findings?

- This article provides clarity for the concept of chronic unexplained orchialgia and describes its antecedents and consequences.
- This article presents an updated definition for chronic unexplained orchialgia that is based on the existing literature.
- This article offers rationale for rejecting the multiple terms for chronic unexplained orchialgia used interchangeably in the past.

How should the findings be used to influence policy/practice/research/education?

- A clear definition for chronic unexplained orchialgia grounds this concept in language and in theory, allowing clinicians to accurately identify this condition and treat appropriately.
- Improved recognition of and treatment of chronic unexplained orchialgia by nurses will help minimize the inappropriate use of healthcare resources and maximize quality of life for men and their families.
- This article suggests an organizing framework for future research into chronic unexplained orchialgia, as part of the basis for a middle range theory.

further complicated by the multiple factors that influence the experience of chronic pain (e.g. anxiety, sociocultural influences, psychological factors and family support) (Eccleston 1995, DeLeo 2006, Melzack & Wall 2008). Chronic pain interferes with an individual’s functional capacity, increases stress, changes family dynamics, decreases quality of life (QOL) and alters the ability to fulfil spousal, social and job roles (Gatchel 2004, Gatchel *et al.* 2007). Because social and cultural factors can influence chronic pain severity and subsequent disability, physical findings alone may not provide a complete, satisfactory or holistic definition for this pain (Gatchel *et al.* 2007, Karoly & Ruehlman 2007). APRNs are uniquely positioned to intervene to improve QOL, not just for individual men, but also for their families, by virtue of their focus on the wholistic needs of clients and attention to understanding the multiple dimensions affected by chronic pain.

There is a paucity of literature describing the phenomenon of chronic unexplained orchialgia (Quallich & Arslanian-Engoren 2013). Medical and surgical therapies have met with limited success, with little empirical support for current treatment algorithms. The phenomenon of chronic unexplained orchialgia is not limited to the USA. Previous papers, although limited in number, demonstrate that this is a global clinical condition that has been identified in men from North America, the UK, eastern and western Europe and China. To date, specific cultural or ethnic predispositions for chronic unexplained orchialgia have not yet been identified, but may be important influences on the experience of men with this condition.

Moreover, while a precise estimation of the incidence of chronic unexplained orchialgia is lacking, chronic scrotal pain is diagnosed in 4.75% of all men presenting to urology clinics, 18.6% of these men have pain that remains unexplained (Ciftci *et al.* 2010). Further clouding the ability to estimate the incidence of chronic orchialgia is that for billing purposes, this clinical symptom is non-specifically coded (Table 1). As a result, it is very difficult to precisely document the incidence of chronic unexplained orchialgia in men. The process of understanding this complex, multifaceted phenomenon begins with clarifying the definition of this concept.

Background

Analysing the concept of chronic unexplained orchialgia begins with the broader construct of chronic pain. The English word ‘pain’ has its origins in the Latin word *poena*, meaning ‘punishment’ or ‘penalty’. In the earliest recorded uses of the word, pain is understood as an inescapable negative part of the human experience. The definition of ‘pain’ most consistently cited in contemporary literature was developed by the International Association for the Study of Pain (IASP) (1994): ‘an unpleasant sensory and emotional experience associated with actual or potential tissue dam-

Table 1 International Statistical Classification of Diseases (ICD) Codes for chronic orchialgia.

Code	System
608.9 Unspecified disorder of male genital organs	ICD-9-CM
N50.9 Disorder of male genital organs, unspecified	ICD-10 system for 2014

ICD codes are a system of alpha-numeric codes to classify diseases, signs, symptoms and abnormal findings. There is no code specific to ‘orchialgia’.

age, or described in terms of such damage' (para. 4). Furthermore, IASP puts forth that:

Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life... pain is that experience we associate with actual or potential tissue damage. It is unquestionably a sensation in a part or parts of the body, but it is also always unpleasant and therefore also an emotional experience...If they regard their experience as pain and if they report it in the same ways as pain caused by tissue damage, it should be accepted as pain (IASP 1994, para. 5).

This definition emphasizes that pain is subjective. The individual experiencing the pain expresses its details to others, who interpret this expression of pain and place it into a meaningful context (personal or clinical). The Institute of Medicine (IOM) (2011, p. xi) adds to this subjective conceptualization of pain by describing it as a 'complex and evolving interplay of biological, behavioral, environmental and societal factors' and identifies chronic pain as a costly public health crisis.

Rosenquist *et al.* and the American Society of Anesthesiologists Task Force on Chronic Pain Management (2010, p. 810) offer a contemporary definition of chronic pain: 'pain of any etiology not directly related to neoplastic involvement, associated with a chronic medical condition or extending in duration beyond the expected temporal boundary of tissue injury and normal healing and adversely affecting the function or well-being of the individual'. This definition reinforces the premise that chronic pain has an

impact on quality of life, social roles and economic productivity.

A recent review of the literature on chronic unexplained testicular pain (Quallich & Arslanian-Engoren 2013) found a dearth of primary sources describing this phenomenon. Multiple search terms were used to identify sources discussing this phenomenon, denoting a lack of conceptual clarity for this concept. While the concept of chronic unexplained orchialgia has been used in clinical practice, its application lacks conceptual clarity, contributing to multiple terms describing this phenomenon. Focusing exclusively on the clinical aspects of chronic unexplained orchialgia has perpetuated use of the concept without a clear, concise conceptualization and operationalization to guide both nursing and clinical care.

At present, despite the lack of conceptual clarity, no concept analysis of chronic unexplained orchialgia has been conducted. Commonly cited definitions for chronic orchialgia, are presented by chronological appearance in the literature (Table 2) and provide the timeline for its clinical conceptualization. However, these definitions, presented as a conceptual timeline, are incomplete, as each fails to capture the multidimensional nature of the concept. As such, separately and collectively, they only provide superficial insight into men's experience with testicular pain. Furthermore, the failure to provide an inclusive definition consistent with the multiple domains affected by chronic pain does not provide a comprehensive understanding of the concept's strengths, defining attributes or weaknesses that will be

Table 2 Terms describing chronic pain in the male genitals.

Term	Definition	Comments
Chronic orchialgia	'Intermittent or constant unilateral or bilateral testicular pain three months or longer in duration that significantly interferes with the daily activities of a patient so as to prompt him to seek medical attention' (Davis <i>et al.</i> 1990, p. 936)	Localizes pain specifically to testis(es) Does not address the multiple domains affected by chronic pain
Chronic scrotal contents pain	'Chronic pain that occurs in any portion of the scrotum or its contents' (Levine 2010, p. 209)	Does not acknowledge differences in structure, function, or innervation of the scrotal contents Does not address the multiple domains affected by chronic pain
Scrotal pain syndrome	'Persistent or recurrent episodic scrotal pain associated with symptoms suggestive of urinary tract infection or sexual dysfunction, without confirmed epididymoorchitis or other obvious pathology' (Fall <i>et al.</i> 2010, p. 5).	Joint EAU/ICS definition Includes testicular pain syndrome and postvasectomy pain syndrome Does not address the multiple domains affected by chronic pain
Testicular pain syndrome	IASP Taxonomy: 'persistent or recurrent episodic pain in the testis... often associated with negative cognitive, behavioral, sexual or emotional consequences', includes 'symptoms suggestive of urinary tract or sexual dysfunction' (IASP 2011)	Evidence for urinary and sexual dysfunction lacking (Quallich & Arslanian-Engoren 2013)

EAU, European Urological Association; IASP, International Association for the Study of Pain; ICS, International Continence Society.

helpful to nurses who assess, treat or counsel men and their families for this condition.

Understanding chronic unexplained orchialgia has been further limited by the recent trend establishing broad, but similar, concepts for the description of chronic male genital pain (Table 2). These varied terms highlight the lack of consensus for this concept and reveal that knowledge of this concept is based in anecdotal evidence or opinion rather than vigorous inquiry. These inconsistencies demonstrate the need for conceptual clarity and an operational definition of chronic unexplained orchialgia to promote its accurate characterization and facilitate clear communication among nurses, men, family members and other healthcare providers regarding this important men's health issue. Clear communication, in turn, lends itself to better identification of this concept and promotes consistent use among healthcare professionals.

According to Walker and Avant (2011), the purpose of a concept analysis is to examine the structure and function of a concept with the goal of clarification of the concept of interest. This clarification allows the development of a useful and meaningful concept and promotes the capacity to distinguish it from other similar concepts. Concept analysis establishes defining attributes that can be used for communication regarding its meaning or similarities with other concepts and avoids interchangeable labels to describe the phenomenon, enhancing its utility as a concept in healthcare settings and among healthcare providers and patients and their families.

The methodological, iterative approach for this concept analysis is based on the Walker and Avant (2011) method: (1) selecting of the concept; (2) determining of the purpose of the analysis; (3) identifying current uses of the concept; (4) determining defining attributes; (5) model case; (6) identification of related cases; (7) specifying antecedents, consequences and empirical referents.

Purpose of the analysis

The purpose of this concept analysis is to clarify the concept of chronic unexplained orchialgia, identify its key attributes and antecedents, develop an operational definition for use in guiding future research, diagnosis, treatment and practice and to provide a basis for future instrument development.

Data sources

A comprehensive search of the published literature was conducted from January 1970–31 December 2012, using the following databases: Google Scholar; MEDLINE; CINAHL; ProQuest; PSYCHinfo; Web of Science and SCOPUS. We

completed our review of the literature on 8 January 2013, ensuring, as best as possible, a review of the published literature on this phenomenon in the past 42 years. The following keywords were used: testicular pain, orchialgia, testalgia, epididymal pain, scrotal pain, male genital pain, orchidynia and orchialgia. Each of these words was paired with 'chronic' yielding 16 distinct search terms. Only articles that were published in English with full text available were included. Excluded were book chapters, review articles, published abstracts, commentaries, patents, animal studies and studies with children under the age of 18. Sources that included an identified cause for chronic orchialgia, (e.g. malignancy or postvasectomy pain) were also excluded.

The initial search yielded 1089 initial sources (Figure 1), but after application of the exclusion criteria and elimination of duplicates, a total of 26 articles formed the basis for the subsequent concept analysis. The articles were strictly reviewed to ensure that participants included men with chronic orchialgia for which no organic cause had been established. To ensure consistency, the analysis was completed by the main author and reviewed by CAE.

The exclusion criteria resulted in elimination of one of the most frequently cited articles on chronic testicular pain (Davis *et al.* 1990). This was done because it included boys as young as 11 (range 11–69), and the aetiology and experience of chronic orchialgia in adolescent and pre-adolescent boys are likely to be different from those of adult men. Two additional papers (Perimenis *et al.* 1994, van Haarst *et al.* 1999) were also omitted because of the age of the patients (as young as 14 and 10 respectively).

Results

Based on review of the 26 articles, multiple terms are used to describe chronic pain to the testicle, including individual terms that include 'orchialgia' as part of its definition (Table 3). This review yielded no articles authored by nurses. Limited information exists regarding the specific situations where this concept is applied and there is a limited number of clinically diverse disciplines (e.g. urology, anaesthesiology, physical therapy) offering a perspective on this phenomenon.

A review of the 26 articles demonstrated variations in the use of the concept of chronic unexplained orchialgia. This is reflected in the inconsistent language used to describe this condition, as well as the inability to establish a phenotype for this condition based on the attributes reported. There are few subjective descriptors reported, making it challenging to determine critical defining attributes or key

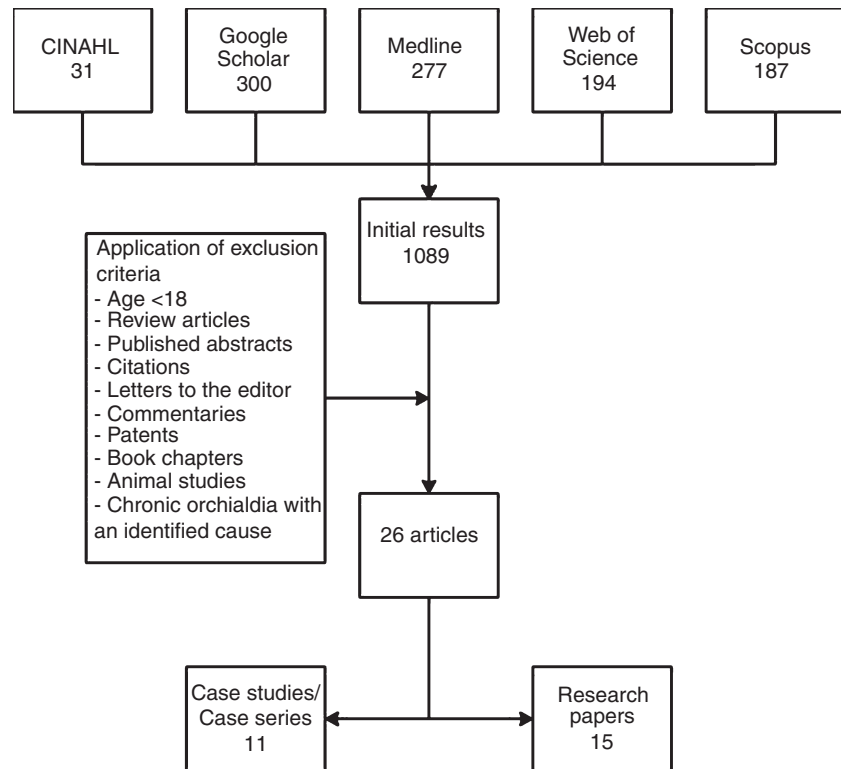


Figure 1 Search results using keywords. Proquest and PSYCHInfo databases yielded no results. There is significant overlap in results among columns. The search terms ‘orchialgia’, ‘male genital pain’, ‘chronic male genital pain’ were so general as to be unhelpful and typically included conditions with a specific aetiology.

characteristics used to define chronic unexplained orchialgia. While the biological components of pain are reported (e.g. pain intensity), there are few reports of psychosocial contributors to this concept. The lack of information regarding the situational and sociocultural context of this phenomenon limits accurate conceptualization.

Current use of the many terms for chronic orchialgia in these articles lacks clarity and specificity. Conditions labelled as testicular pain, either by men or their providers, do not always indicate localization to the testes. Descriptions fail to account for differences in structure and function of the scrotal organs or differences in innervation. Current use of ‘chronic orchialgia’ lacks specificity, as it defines an independent clinical concept that is part of the defining characteristics of other conditions (e.g. scrotal pain syndrome), all of which contribute to conceptual ambiguity.

Defining attributes

Walker and Avant (2011) discuss defining attributes as those that are frequently associated with the concept and allow for the broadest conceptual insight. Seven defining attributes of chronic unexplained orchialgia were identified. It is present in adult men 18 years and older, characterized as a subjective negative sensation in the

testes that is perceived by the individual as pain of variable intensity and has been present for at least three months. It is intermittent or continuous pain that localizes to one or both testes. Objective physical findings are absent and it is not synonymous with an organic cause or other pathology.

Related concepts

As critical attributes for chronic unexplained orchialgia were identified from the literature, three closely related concepts emerged. These may interfere with an accurate description of chronic unexplained orchialgia because they share some, but not all of the defining attributes and definitional commonalities. However, these related descriptors are distinct and different from the concept of chronic unexplained orchialgia.

Postvasectomy pain syndrome

Postvasectomy pain syndrome occurs at some point after a man has a vasectomy; it can occur months after the procedure or it may be years later (Werthman 2010). This pain can be chronic in nature and is secondary to congestion and inflammation of the epididymis. Incidence of postvasectomy pain syndrome is estimated to affect 1–6% of men who undergo the procedure (Keoghane &

Table 3 Terms in use to describe pain that localizes to testicle.

Term	Definition	Origin
Testalgia	Orchialgia	testis + G. <i>algos</i> , pain
Orchidynia	Orchialgia	G. <i>orchis</i> , testis orchi- + G. <i>odyne</i> , pain
Orchalgia	Pain in a testis	G. <i>orchis</i> , testis
Orchialgia	Pain in a testis, testicular pain	G. <i>orchis</i> , testis orchi- + G. <i>algos</i> , pain
Orchidalgia	Pain in the testicle, often due to a varicocele, orchitis, or torsion of the testis, pain may also be caused by a hernia in the groin or presence of a stone in the lower ureter 'neuralgic pain, radiating from the testes and occurring as the result of prolonged and excessive sexual stimulation falling short of natural intercourse' (p. 232, Jensen P. (1962) The clinical aspects of orchidalgia. <i>J Coll Gen Pract</i> 5(2), 232–237.)	G. <i>orchis</i> , testis G. <i>algos</i> , pain

<http://dictionary.reference.com>.

G. = Greek.

Sullivan 2010). Men with this pain complaint are frequently referred to urology clinics for chronic testicular pain. With careful examination, pain is localized to one or both of the epididymes, not the testes.

Chronic scrotal contents pain

Chronic scrotal contents pain is chronic pain that may involve the testicle and/or the epididymis, paratesticular structures or spermatic cord (Levine 2010, Benson & Levine 2012). This term has been proposed to include the influence of any neurological crossover and overlap of input from the sensory nerves that innervate these scrotal structures. Incidence for this condition has not been reported.

Male chronic pelvic pain syndrome

Locations of pain associated with this clinical syndrome include the testes, epididymis, pelvic floor and prostate (Fall *et al.* 2010). In men, it has a population prevalence estimated to be between 2–16% (Tripp *et al.* 2006). While pain is a primary complaint, there is a low association

between reported symptoms and objective physical findings and men recount a history of multiple unsuccessful treatments (Egan & Krieger 1997). This is consistent with the description of patients with other chronic pain conditions, such as chronic fatigue syndrome and interstitial cystitis (Wessely *et al.* 1999).

Model and constructed cases

Examination of a concept is aided by evaluation of cases that demonstrate the concept and examples of other cases that are similar, but lack important defining attributes (Walker & Avant 2011). These cases can be based in clinical practice experience or constructed after a comprehensive review of the literature. Both are used in the construction of cases presented in this concept analysis.

Model case

A model case is an exemplar of a phenomenon and demonstrates all its defining attributes (Walker & Avant 2011). The following is a model case for chronic unexplained orchialgia:

AR is a 37-year-old man who presents to Urology clinic with complaints of chronic orchialgia lasting 17 months. His history is notable for spontaneous onset of right testicular pain while watching television and his previous visits to five different specialty providers seeking pain relief. There is no history of trauma, infection or low back injury. The pain is 'gnawing' and waxes and wanes independent of activity. It has prevented him from pursuing his hobby of competing in triathalons, decreased his productivity as an information technologies manager and has limited his time as middle school robotics coach. AR has undergone serial physical examinations and scrotal ultrasounds that have consistently been normal and spermatic cord blocks and ilioinguinal blocks provided only a few hours' relief. To date, no explanation for his pain has been identified.

Borderline case

A borderline case contains many of the defining attributes, but not all of them (Walker & Avant 2011). The following is a borderline case related to chronic orchialgia:

LS is a 22-year-old man with a 8-month history of left testicular pain that began after he was kicked during a Muay Thai class. The 'achy' pain has never completely resolved. Previous physical examinations were unrevealing. He has been treated with inflammatory, antibiotics and a short course of narcotic pain medication

with limited improvement. The pain has been slowly increasing, and he has noticed that his testis feels 'heavy' as well. On current examination, he reports pain only with palpation of his left testis. Ultrasound shows an intratesticular mass that is suspicious for malignancy.

Related case

Related cases demonstrate similarity to the concept being studied, but, on close examination, lack attributes of the concept of study (Walker & Avant 2011). Related cases often help clarify the phenomenon being studied and how it is distinct from similar phenomenon. In this instance, the related case demonstrates the importance of history taking and precise physical examination:

TM is a 44-year-old man who has been plagued by left-sided scrotal and testicular pain for several months that has limited his physical activities. His pain increases somewhat after ejaculation. He has seen many providers in his primary care practice and been treated with anti-inflammatories, antibiotics and a short course of narcotic pain medication with minimal improvement. He is eventually referred to a urology provider who localizes his pain on physical examination to his left epididymis, confirms that he had a vasectomy 8 months ago and diagnoses postvasectomy pain syndrome.

Contrary case

Contrary cases offering clear examples of what the phenomenon is not (Walker & Avant 2011) and help provide insight into the attributes that define the phenomenon of interest:

HB is a 19-year-old undergraduate student who presents with an eight-hour history of spontaneous, acute onset right scrotal pain. He describes the pain as 'nauseating.' On examination, his right scrotum is enlarged and painful to the point that he can barely tolerate touch, but the pain appears to localize to his epididymis. This is confirmed on scrotal ultrasound that demonstrates increased blood flow to his right epididymis. Further discussion of his history reveals that he has been engaging in unprotected intercourse with multiple partners. He is subsequently diagnosed and treated for a sexually transmitted infection.

Illegitimate case

The illegitimate case is infrequently presented as part of a concept analysis. Walker and Avant (2011) describe the illegitimate case as an example of an improperly used concept.

The description of an illegitimate case can help illustrate the defining attributes of the concept of interest. It may share defining attributes with the phenomenon, but many of the defining attributes are absent or taken out of context. This is particularly pertinent to the analysis of the concept of chronic unexplained orchialgia, as men with this condition may be inaccurately diagnosed, in part due to improper use of the concept. This illegitimate case is a composite drawn from years of clinical practice and demonstrates the need for conceptual precision and uniform definition. If the concept of chronic unexplained orchialgia is inappropriately conceptualized or taken out of context, it perpetuates the present difficulties in establishing the true prevalence of chronic orchialgia and in identifying a potential phenotype for this condition to guide to successful treatment interventions:

CK is a 29-year-old man referred to urology clinic for chronic intermittent left testicular pain. He has been seen by multiple providers for this pain that has come and gone for at least three years. He reports that it seems to become worse the longer he is standing and this pain interferes with his work as a personal trainer. Previous examinations have been negative and his referral paperwork reveals he has been labelled as a malingerer and drug seeker. He has been treated with anti-inflammatories and antidepressants and is currently taking narcotic pain medication, with little relief. A meticulous physical examination by the nurse practitioner demonstrates that his pain is focally located over the left spermatic cord, not the left testis and is consistent with the bulky grade 2 varicocele found on examination.

Antecedents and consequences

The primary antecedent for chronic unexplained orchialgia is recognition of a sensation as pain in the testis(es) and choosing to seek evaluation. While there may be some inciting event (e.g. trauma, infection or injury), consistent conditions that precede the onset of chronic unexplained orchialgia are poorly understood and defined. Implicated causes include postvasectomy pain, epididymitis, varicocele, prostatitis, hydrocele, testicular tumour and radicular pain (Keoghane & Sullivan 2010, Luzzi 2003, Masarani & Cox 2003, Levine 2010, Basal *et al.* 2012). The cause of the pain remains unknown in 18.6% (Ciftci *et al.* 2010) – 25% of men (Davis *et al.* 1990).

The consequences of this condition are that men report lower quality of life (Ciftci *et al.* 2011) and demonstrate avoidance behaviours (e.g. avoidance of intimate sexual activity) that affect their family and personal lives. Social

consequences of chronic unexplained orchialgia include excessive medication use, lost productivity or inability to maintain employment due to pain, alteration in roles (social, work, spousal) and decline in overall function. Additional consequences include multiple interactions with the healthcare system in an attempt to alleviate and manage their chronic unexplained orchialgia.

Empirical referents

Empirical referents are defined by Walker and Avant (2011) as actual phenomenon that relate to the defining attributes and demonstrate the occurrence of the concept of interest, thereby becoming the means to recognize or find the defining attributes of the concept. Empirical referents for chronic unexplained orchialgia are largely undescribed, with the exception of self-report measures of pain and the duration of the pain. There are few measurable changes to vital signs. To maintain consistency with IOM (2011) recommendations regarding the evaluation of chronic pain, qualifiers such as location, quality and pattern of the pain should be included. Objective referents, while absent from the literature, could include scores on standardized psychometric tools, such as the McGill Pain Questionnaire (Melzack 1975) and the Pain Catastrophizing Scale (Sullivan *et al.* 1995), a history of medication use, and the inclusion of a pain map. Subjective measures could include a description of pain in the patient's own words, self-report of sleep disturbance or altered attention and a history of avoidance behaviours that may include a decline in sexual activity or absenteeism at work.

Definition

Based on the synthesis of findings from this concept analysis, the following definition for chronic unexplained orchialgia is proposed:

Chronic unexplained orchialgia is a subjective negative experience of adult men, perceived as intermittent or continuous pain of variable intensity, present at least three months, localizing to the testis (es) in the absence of objective organic findings that interferes with quality of life.

Discussion

This concept analysis makes an important contribution by developing a contemporary and precise definition for chronic unexplained orchialgia that can be used in building the evidence base to guide nursing interventions to improve the

quality of life of these men and their families. Furthermore, it can be used to develop a middle range or situation-specific theory to better understand this phenomenon and inform advanced nursing practice. Identifying its critical attributes serves as a foundation for theory development, contributes to the operationalization of the concept and resolves issues regarding imprecise identification in clinical settings. Furthermore, it can be used to develop a framework from which to evaluate clinical practice, pain relief and quality-of-life outcomes. A more comprehensive understanding of the concept of chronic unexplained orchialgia benefits clinicians, patients and the healthcare system as a whole.

Overlap among diverse terms has made integration of potential attributes from the various articles difficult. Umbrella terms describing chronic male genital pain should be abandoned for conceptually derived ones. The definition put forth as a result of this concept analysis demonstrates the need for experience and precision in performing the physical examination on these men. It validates the need for a partnership between the examining clinician and the patient, to establish the precise localization of the pain to the testis(es). By identifying the precise nature and location of chronic pain complaints, inappropriate and ineffective treatments may be avoided. With increased understanding, differential diagnosis will be improved, as will quality of life for these men, as their complaint will be accurately identified and treated.

This concept analysis further highlights the gaps in available knowledge regarding this phenomenon. This phenomenon exists at the intersection of chronic pain, male urology and sexual medicine, yet little is known about their experience from a psychosocial or cultural perspective. This further hinders the ability of nurses and clinicians at all levels to effectively identify and treat men at risk for developing chronic unexplained orchialgia and limits the ability of clinicians to anticipate the clinical care needs of these men and their families.

A solid conceptual foundation for chronic unexplained orchialgia is particularly important, given the fact that this pain occurs in an area of the body that is fraught with social restrictions and privacy issues that are governed by religious, cultural and popular conventions. This is noteworthy in the face of increasing globalization and the likelihood that clinicians will evaluate men from various social, religious and ethnic backgrounds. It is recognized that not all men are willing to openly discuss complaints relative to their sexual and reproductive organs and expressing these concerns can be very stressful. Improved conceptual clarity regarding clinical conditions affecting the male genitalia will enhance our understanding and ability to treat successfully.

Limitations

There are two limitations to this concept analysis. The majority of studies examined were from US or European authors, limiting the cultural context and restricting the ability to draw conclusions regarding non-Western culturally and socially based attributes. Fifteen of the studies reviewed were descriptive studies with minimal accounts of pain quality or documentation of the lived experience of men with chronic unexplained orchialgia.

Conclusions

This concept analysis, and the proposed concise definition, was motivated by the changing scientific understanding of chronic pain, as it applies to a focused area of men's health. Current approaches to populations with chronic pain advocate the use of the Biopsychosocial Model when evaluating their overall experience. We support its use as a conceptual framework for future research on chronic unexplained orchialgia. It includes consideration of the multifactorial nature of an individual's symptom experience and is advocated by the IOM (2011) as part of its blueprint for future research into chronic pain. Use of the Biopsychosocial Model to explore chronic unexplained orchialgia will acknowledge the perspective that a particular pain complaint exists within a larger context of the person's history, experiences and environment. This approach acknowledges that a symptom complaint from an individual has been formed by aspects of their history that might not be outwardly obvious (Borrell-Carrio *et al.* 2004), including sexual and cultural norms and economic status.

The unique perspective of nursing regarding the interactions of people and their environments and its perspective on relationships with health and the human experience make it invaluable for guiding research into chronic unexplained orchialgia. Future interdisciplinary research should move towards addressing the multiple gaps in knowledge regarding this chronic pain condition as a whole, akin to the manner in which diabetes or hypertension is viewed. As a result of this analysis, it is clear that future research designed to address significant gaps in the knowledge about this phenomenon must include the subjective components of this experience, as well as the objective clinical findings to promote improved clinical management.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of interest

No conflict of interest has been declared by the authors.

Author contributions

All authors have agreed on the final version and meet at least one of the following criteria [recommended by the ICMJE (http://www.icmje.org/ethical_1author.html)]:

- substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
- drafting the article or revising it critically for important intellectual content.

References

- Basal S., Ergin A., Yildirim I., Goktas S., Atim A., Sizlan A., Irkilata H.C., Kurt E. & Dayanc M. (2012) A novel treatment of chronic orchialgia. *Journal of Andrology* 33(1), 22–26.
- Benson J.S. & Levine L.A. (2012) Evaluation and therapy of chronic scrotal content pain and epididymitis. In *Urological Men's Health: A Guide for Urologists and Primary Care Physicians* (Shoskes D.A., ed.), Springer, New York, pp. 181–187.
- Borrell-Carrio F., Suchman A.L. & Epstein R.M. (2004) The Biopsychosocial model 25 years later: principles, practice and scientific inquiry. *Annals of Family Medicine* 2, 576–582.
- Ciftci H., Savas M., Yeni E., Verit A. & Topal U. (2010) Chronic orchialgia and associated diseases. *Current Urology* 4(2), 67–70.
- Ciftci H., Savas M., Gulum M., Yeni E., Verit A. & Topal U. (2011) Evaluation of sexual function in men with orchialgia. *Archives of Sexual Behavior* 40(3), 631–634.
- Davis B.E., Noble M.J., Weigel J.W., Foret J.D. & Mebust W.K. (1990) Analysis and management of chronic testicular pain. *The Journal of Urology* 143(5), 936–9.
- DeLeo J.A. (2006) Basic science of pain. *The Journal of Bone and Joint Surgery* (Suppl. 2), 58–62.
- Eccleston C.C. (1995) Chronic pain and distraction: An experimental investigation into the role of sustained and shifting attention in the processing of chronic persistent pain. *Behaviour Research and Therapy* 33(4), 391–405. doi:10.1016/0005-7967(94)00057-Q.
- Egan K.J. & Krieger J.L. (1997) Chronic a bacterial prostatitis: a urologic chronic pain syndrome? *Pain* 69, 213–218.
- Fall M., Baranowski A.P., Elneil S., Engeler D., Hughes J., Messelink E.J., Oberpenning F. & Williams A.C. (2010) European Association of Urology: EAU guidelines on chronic pelvic pain. *European Urology* 57, 35–48.
- Gatchel R.J. (2004) Comorbidity of chronic pain and mental health disorders: the biopsychosocial perspective. *American Psychologist* 59(8), 795–805. doi:10.1037/0003-066X.59.8.795.
- Gatchel R.J., Peng Y.B., Peters M.L., Fuchs P.N. & Turk D.C. (2007) The biopsychosocial approach to chronic pain: scientific advances and future directions. *Psychological Bulletin* 133(4), 581–624. doi:10.1037/0033-2909.133.4.581.

- van Haarst E.P., van Andel G., Pels Rijcken T.H., Schatmann T.J.M. & Taconis W.K. (1999) Value of diagnostic ultrasound in patients with chronic scrotal pain and normal findings on clinical examination. *Urology* 54(6), 1068–1072.
- Institute of Medicine (2011) *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education and Research*. The National Academies Press, Washington, DC.
- International Association for the Study of Pain (1994) Part III: Pain terms, a current list with definitions and notes on usage. In *Classification of Chronic Pain*, 2nd edn (Merskey H. & Bogduk N., eds), IASP Task Force on Taxonomy. IASP Press, Seattle, WA. Retrieved from http://www.iasp-pain.org/AM/Template.cfm?Section=Pain_Definitions&Template=/CM/HTMLDisplay.cfm&ContentID=1728#Pain on 18 September 2012.
- International Association for the Study of Pain (2011) *Classification of Chronic Pain*, 2nd edn (revised). IASP Task Force on Taxonomy, Loeser, J.D. (chair). IASP Press, Seattle, WA. Retrieved from http://www.iasp-pain.org/Content/NavigationMenu/Publications/FreeBooks/Classification_of_Chronic_Pain/default.htm on 18 September 2012.
- Karoly P. & Ruchlman L.S. (2007) Psychosocial aspects of pain-related life task interference: an exploratory analysis in a general population sample. *Pain Medicine* 8(7), 563–572.
- Keoghane S.R. & Sullivan M.E. (2010) Investigating and managing chronic scrotal pain. *BMJ* 341, 1263–1266.
- Levine L. (2010) Chronic orchialgia: evaluation and discussion of treatment options. *Therapeutic Advances in Urology* 2, 209–214.
- Luzzi G. (2003) Male genital pain disorders. *Sexual and Relationship Therapy* 18(2), 225–235.
- Masarani M. & Cox R. (2003) The etiology and pathophysiology and management of chronic orchialgia. *BJU International* 91, 435–437.
- Melzack R. (1975) The McGill Pain Questionnaire: major properties and scoring methods. *Pain* 1(3), 277–299.
- Melzack R. & Wall P.D. (2008) *The Challenge of Pain*. Penguin Books, London (original work published 1982).
- Perimenis P., Speakman M.J. & Higgins S. (1994) Chronic scrotal pain. a study of its causes and management. *International Urology and Nephrology* 26(3), 345–347.
- Quallich S.A. & Arslanian-Engoren C. (2013) Chronic testicular pain in adult men: an integrative literature review. *American Journal of Men's Health* 7(5), 402–413.
- Rosenquist R.W., Benzon H.T., Connis R.T., De Leon-Casasola O.A., Glass D., Kovevaar W.C., Mekhail N.A., Merrill D.G., Nickinovich D.G., Rathmell J.P., Sang C. & Simon D.L. (2010) Practice guidelines for chronic pain management. *Anesthesiology* 112, 810–33.
- Sullivan M.J., Bishop S.B. & Pivik J. (1995) The Pain Catastrophizing Scale: development and validation. *Psychological Assessment* 7(4), 524–532.
- Tripp D.A., Nickel J.C., Wang Y., Litwin M.S., McNaughton-Collins M., Landis R., Alexander R.B., Schaffer A.J., O'Leary M.P., Pontari M.A., Fowler J.E., Nyberg L.M. & Kusek J.W. (2006) Catastrophizing and pain-contingent rest predict patient adjustment in men with chronic prostatitis chronic pelvic pain syndrome. *The Journal of Pain* 7(10), 697–708.
- Walker L.O. & Avant K.C. (2011) Concept analysis. In *Strategies for Theory Construction in Nursing*, 5th edn (Walker L.O. & Avant K.C., eds), Prentice Hall, Boston, pp. 157–179.
- Werthman P. (2010) Vasectomy reversal for post-vasectomy pain syndrome: a ten year experience. *Journal of Urology* 183(Suppl), e752.
- Wessely S., Nimnuan C. & Sharpe M. (1999) Functional somatic syndromes: one or many? *The Lancet* 354, 936–939.

The *Journal of Advanced Nursing (JAN)* is an international, peer-reviewed, scientific journal. *JAN* contributes to the advancement of evidence-based nursing, midwifery and health care by disseminating high quality research and scholarship of contemporary relevance and with potential to advance knowledge for practice, education, management or policy. *JAN* publishes research reviews, original research reports and methodological and theoretical papers.

For further information, please visit *JAN* on the Wiley Online Library website: www.wileyonlinelibrary.com/journal/jan

Reasons to publish your work in *JAN*:

- **High-impact forum:** the world's most cited nursing journal, with an Impact Factor of 1.527 – ranked 14/101 in the 2012 ISI Journal Citation Reports © (Nursing (Social Science)).
- **Most read nursing journal in the world:** over 3 million articles downloaded online per year and accessible in over 10,000 libraries worldwide (including over 3,500 in developing countries with free or low cost access).
- **Fast and easy online submission:** online submission at <http://mc.manuscriptcentral.com/jan>.
- **Positive publishing experience:** rapid double-blind peer review with constructive feedback.
- **Rapid online publication in five weeks:** average time from final manuscript arriving in production to online publication.
- **Online Open:** the option to pay to make your article freely and openly accessible to non-subscribers upon publication on Wiley Online Library, as well as the option to deposit the article in your own or your funding agency's preferred archive (e.g. PubMed).