An interdisciplinary approach to the management of vocal cord dysfunction in an elite female swimmer: A case study

Abstract

Acute pulmonary disorders are commonplace within the athletic population, with exercise induced bronchoconstriction, and vocal cord dysfunction (VCD) common diagnoses. VCD is a condition that causes the vocal folds to close during inhalation, causing obstruction at the larynx and thereby a severely impaired sporting performance. VCD can be brought on by laryngeal irritants, emotional and psychological stress and asthma. The present case study details the interdisciplinary approach to the treatment of an elite female swimmer with VCD with an intervention programme that lasted nine weeks, instigated by a local general practitioner who chose to engage a sport psychology practitioner due to the sport-specific nature of the psychological stress she experienced. The steps involved in the design of the sport psychology interventions are outlined and the relationship of those interventions to the work of the other specialists is discussed. The nine-week intervention programme was aimed at reducing the swimmer's levels of precompetitive state anxiety and perfectionist tendencies; using a combination of goal-setting, imagery, and cognitive restructuring. During the course of nine weeks, the athlete's levels of competitive state anxiety and perfectionist tendencies reduced over time along with the frequency of VCD occurrence.

Key words: *elite sport, swimming, vocal cord dysfunction, competitive anxiety, perfectionism, adolescent*

Context

This case study presents a reflective account of sport psychology support provided as a component of an interdisciplinary approach to the treatment of vocal cord dysfunction in an elite swimmer. As a British Psychological Society (BPS) chartered psychologist and a British Association of Sport and Exercise Sciences (BASES) accredited sport and exercise scientist part of my role involves providing sport psychology support to individual athletes. For the majority of my clients, the support I provide is aimed at performance enhancement. A small number of clients seek assistance with performance restoration as a result of performance dysfunction driven by subclinical developmental, interpersonal intrapersonal or transitional issues (e.g., Gardner & Moore, 2005). Performance restoration has been described aptly by Portenga, Aoyagi, Balague, Cohen and Harmison as the process of "...helping a performer remove barriers to allow them to return to performing at an already established level" (p.13; 2011). The case at the centre of this article describes the lifecycle of a bespoke intervention that formed part of an interdisciplinary approach to supporting an elite swimmer with the management of a performance-limiting condition called vocal cord dysfunction (VCD) for the purposes of performance restoration. At the time of the intervention I had experience of providing sport psychology support to individual elite swimmers for nine years.

Practice Philosophy

The philosophy that drives my practice, is deliberately fluid and evolves carefully to ensure that it is adaptive to the needs of my clients. In the case outlined below, my practice philosophy was based on a cognitive-behavioural approach. I purposefully adopted the cognitive-behavioural approach as my client was presenting with medical diagnosis of VCD, the driver of which was suspected to be precompetitive state anxiety. In instances such as this, there was a definitive problem to solve, and an intervention strategy to design, which

suits a practitioner-led cognitive-behavioural approach (see Keegan, 2016). Practitioner-led approaches are characterised by objective measurement rather than subjective judgement, and involves the practitioner designing an empirically-focused intervention with goals for each of the sessions (Keegan, 2016). In addition, the cognitive and behavioural foci work on the assumption that practitioners can help clients change their beliefs in order to bring about a change in their behaviour (Dozois & Beck, 2011). In this case, my choice of practice philosophy was driven by the needs of the client. As I was working within an interdisciplinary team, it was also important to consider how my approach to the case would interact with the philosophical approaches of my fellow team members. Within the interdisciplinary team I was working alongside a general practitioner, a speech and language therapist and a respiratory consultant. Reflecting on the likely differences between us in professional training and practice reminded me that those with a medical education were primarily driven by the biology of the condition being treated. As a sport psychology practitioner however, my approach was less reductionist and more humanistic, with a focus on all aspects of the individual rather than just the biological variables. In my experience, different approaches in practice philosophy can lead to poor communication and misunderstanding when working within a team setting. Rather than attempt to change my own practice philosophy, I explored my understanding of other professionals' perspectives through discussion, and assigned equal value to them in the context of the case (e.g., Drinka & Clark, 2000).

The Case

Overview

The athlete at the centre of this case study was a 15-year-old female elite swimmer, competing nationally for Great Britain. The athlete had reported problems with her breathing

during competitive events where she raced in 400 metre freestyle events. The athlete referred to these episodes as "panic attacks". She reported that the "attacks" came on suddenly during the course of her races, and often affected her performance so badly that she was physically unable to complete them (and was forced to retire from the competition early). The athlete's family took her to her local general practitioner who diagnosed exercise induced asthma and prescribed a salbutamol inhaler for use when experiencing the reported 'attacks'. Over time, the family reported that the instances of these 'attacks' increased, and that the salbutamol inhaler was having no effect. After eight weeks of using the salbutamol inhaler to no avail, the family sought the advice of a medical advisor representing British Swimming, the National Governing Body, who recommended that the athlete be tested for VCD. Subsequently, the athlete was referred to a specialist respiratory clinic where she was diagnosed with VCD and passed back to the local general practitioner for the co-ordination of treatment locally.

Reasons for Seeking Support

I was approached by the athlete's general practitioner who set about putting together an interdisciplinary team to treat the athlete. The team working with the athlete included a respiratory consultant, a speech and language therapist and me performing the sport psychology practitioner role. During our first telephone call, the general practitioner took time to explain the athlete's symptoms and VCD diagnosis to me. She discussed how she believed that the psychological and emotional stress suffered by the athlete was as a result of her “nervousness before competition”. She went on to describe the other specialists working within the team and their role in treating the athlete, and how she believed sport psychology interventions may help complement the treatment. During the initial conversation, I admitted that I had no awareness of the condition of VCD, or indeed no experience of working as part

of a team involving a speech and language therapist or a respiratory consultant. The general practitioner promised that the rest of the treatment team would support me in the design and delivery of any interventions, and signposted me to various sources of information so that I could read in greater detail about the condition and consequently plan my involvement.

The team however, was geographically disparate. The respiratory consultant was based at a specialist clinic 150 miles away from the athlete's home and training centre. The general practitioner suggested that to ensure the condition was treated efficiently, the speech and language therapist and I were recruited, in part, for our proximity to the athlete.

Background Information

The general practitioner described VCD to me as an acute pulmonary disorder, which occurs more frequently in the athletic population (e.g., Hanks, Parsons, Benninger, Kaeding, Best, Phillips, & Mastronarde, 2012). She explained that the two most common diagnoses of breathing complaints within the athletic population are exercise-induced bronchoconstriction and VCD. She talked about the main characteristic of VCD as being recurrent episodes of tightening of the vocal cords causing them not to open properly, causing airflow obstruction at the larynx. The other symptoms she listed included dyspnea (difficulty breathing), tightness at the throat, inspiratory stridor (a high-pitched inspiratory sound), dysphonia (difficulty speaking), respiratory distress and choking (Pope & Koenig, 2005; Wilson & Wilson, 2006). Although the case we were discussing potentially involved VCD being brought about by a combination of emotional and psychological stress (e.g., Powell, Karanfilov, Beechler, Treole, Trudeau & Forrest, 2000) and high intensity exercise (e.g., Rundell & Spiering, 2003), my own research highlighted that there are other possible precursors. These include, laryngeal irritants such as cleaning chemicals, smoke, tile dust, gaseous fumes (Perkner, Fennelly, Balkissoon, Bartelson, Ruttenber & Wood, 1998), and

asthma (Rhodes, 2008). When discussing the athlete's experience of her VCD attacks, I was told that she experienced laryngeal spasm which caused her vocal cords to close, resulting in difficulties in inhaling and exhaling. I learned that the gold standard of treatment for VCD is an interdisciplinary approach (e.g., Christopher & Morris, 2010). To this end, the general practitioner described how she was working with the respiratory consultant to identify the precursors to the onset of VCD, to appoint the relevant specialists to assist the athlete in managing their symptoms (e.g., Campainha, Ribeiro, Guimarães, & Lima, 2012). She explained that some of the common approaches to treatment involve biofeedback, speech therapy, psychological therapy, and botulinum toxin (Anbar & Hehir, 2000; Earles, Kerr, & Kellar, 2003; Wilson & Wilson, 2006), however in this case, speech and language therapy and sport psychology support were jointly selected given the case history of the individual athlete.

Ethics

My first contact with the athlete's mother by telephone allowed me to introduce myself and initiate a brief discussion regarding my likely role as part of the treatment team. I organised the first face-to-face meeting with the athlete and her parents to determine the extent of the problem, and to discuss how I could best provide support in conjunction with the rest of the interdisciplinary team. Discussions at the initial meeting included details of the VCD, its effects on the athlete's swimming performance, and the ultimate aims of the athlete's overall treatment. It became clear that the objective of the treatment was to ensure that the athlete could continue to perform at the highest level, whilst being able to control or even eliminate the symptoms of her VCD. The initial meeting also served as an opportunity to discuss ethical issues such as confidentiality, the limits of my competency (given my inexperience in supporting an athlete suffering with VCD), and a general discussion about the

types of interventions that might be used. I informed the athlete of the type of data that might be generated during my support which included information from the intake, any assessments or questionnaires used, and notes taken during our meetings. I described how I keep this information secure and their right to request access to that information at any time. We also discussed the length of my support to the athlete, which was dictated by budgetary constraints, limiting me to nine, sixty to ninety minute sessions with the athlete.

I anticipated several ethical challenges with this case including confidentiality and the sharing of information, both within the interdisciplinary team, and with the athlete's parents, and the provision of informed consent, given that the athlete was 15 years old at the time of seeking support. As I was working within an interdisciplinary team, I explained to the athlete and her parents that there was an expectation that I would share information with the rest of the team of practitioners treating her for VCD. All parties agreed to consent to these limits of confidentiality, and had confirmed that they had already had similar discussions with the other members of the treatment team.

The issue of informed consent to provide psychological support is somewhat of a grey area with adolescent clients (Jackson, Burns, & Richter, 2014). As a 15-year-old, the athlete was below the age of consent, which meant that technically, her parents were the source of the appropriate legal authority (British Psychological Society, 2008). However, having discussed issues of informed consent with the athlete and her parents, we jointly agreed that she was Gillick competent (cf. Griffith, 2016) and therefore had the functional ability to make an informed decision regarding her treatment. The athlete was therefore the individual who provided informed consent for psychological support. The final ethical challenge to overcome was the logistical arrangements for delivery of support to the athlete. I asked her whether she would prefer to see me with her parents in attendance, on her own, or a combination of both.

She said she was happy to attend her appointments alongside her parents, who were supportive of their daughter gaining control over her condition. They were interested in learning about the psychological skills I had mentioned that may be part of the intervention. However, I reminded the athlete that she could change her mind about her parents accompanying her to the sessions at any point in the future, should a situation arise where she wanted to speak to me without them present.

Needs Analysis and Justification

My main role within the interdisciplinary team was to help the athlete achieve her aim of being able to control or eliminate the symptoms of her VCD, by providing psychological skills interventions to manage the precompetitive state anxiety that the general practitioner suspected was the cause of this condition. To achieve this very specific outcome, when I was planning for the initial meeting, I determined that my "go to" tool for intake and needs analysis - the performance profile - was unlikely to meet the objectives of the referral. Not least because performance profiling is often associated with work to *enhance* performance, whereas the client at the centre of this case was concerned with *restoring* her athletic performance. The additional considerations for intake and needs analysis related to the individual's age: at 15 she was an adolescent, and therefore her family were also keen to get involved in the meeting to provide additional information and to ensure that she could fully communicate the challenges associated with her VCD. Given the initial details I had received about the case, I decided to use the sport-clinical intake protocol (Taylor & Schneider, 1992) with both the athlete (one-to-one) and with her parents to elicit the information needed to gather sufficient detail about the needs of this individual case (Gardner & Moore, 2006; Keegan, 2016).

Client Meetings

I chose to use the sport-clinical intake protocol (Taylor & Schneider, 1992) with the athlete in a one-to-one, face-to-face meeting to gather information about her functioning (or non-functioning) that may have been relevant to the planning, implementing, or evaluating of treatment (e.g., Hughes & Baker, 1990). As the interviewer, I asked questions tailored to the client to ascertain useful background information, but also to 'break the ice' (cf. Taylor & Schneider, 1992). Following the protocol, I asked several semi-structured questions relating to the individual's activities and interests, school and homework, friendships and peer relations, home situation and family, relations, self-awareness and feelings, adolescent issues, alcohol and drugs, dating and romances. I then asked behaviour-specific questions in an order aimed at gathering data on the client's view of her VCD and how it affected her athletic performance. During our discussions, the athlete revealed that she was struggling with precompetitive state anxiety to such a degree that she reported often thinking of ways to avoid competing. Furthermore, she suggested that her attacks of VCD left her embarrassed, scared and with a distinct "feeling of failure". It was also evident from our discussions that the athlete had a propensity to exhibit maladaptive perfectionist tendencies via comments such as "If I don't win [my race], I will lose my place on the talent programme", "My parents and coach expect me to win..." and "I think I'm a failure if I don't beat [name of swimmer] in my race". Although there is no single definition of perfectionism, it is generally understood to be a "multidimensional dispositional achievement orientation" which often involves the flawless attainment of high performance standards (Gilman & Ashby, 2006; Sapieja, Dunn, & Holt, 2011, p.21). Specifically, the athlete appeared to have high levels of self-orientated perfectionism, where she was demanding absolute perfection from her own performance in combination with socially-orientated perfectionism where she perceived her parents and her coach expected flawless performances from her (e.g., Flett & Hewitt, 2005). Towards the

end of the initial session, the athlete confirmed that she would be happy to involve her parents in the following aspect of the meeting, on the basis that their input would be valuable and may bring a distinct perspective to her case.

Regardless of the careful selection and justification of this method of assessment, there is no 'gold standard' for conducting needs analyses with adolescents in this context. Other assessment methods were used that complemented the sport-clinical intake protocol (Taylor & Schneider, 1992). These included talking to the client's parents who were an integral part of the needs analysis process, and the use of self-report measures (see below). However, other means of gathering information was not undertaken due to time constraints this included direct observation (prior to the intervention) and talking to the athlete's coach.

Parental Meeting

My meeting also involved a session with the athlete and her parents where I asked the parents about their perspective on their daughter's social functioning, school functioning, medical and developmental history, family relations and home situation and her strengths and interests. Additionally, I asked them to comment on their view of their daughter's VCD, when it manifests and how it is dealt with. The parents mirrored their daughter's description of her background, attacks of VCD, tendency for perfectionism and how that may be making her precompetitive state anxiety worse. They reiterated her frustration at the difficulty in obtaining an accurate diagnosis.

Summary of Initial Meetings

In summary, the sport-clinical intake protocol (Taylor & Schneider, 1992) with both the athlete and her parents provided consistent information and indicated that the athlete may be showing perfectionist tendencies, and that her pre-competitive state anxiety levels were high enough to lead her to consider not attending important swimming galas on occasions. To

investigate the findings from the sport-clinical intake further, I set about obtaining objective data on levels of perfectionism and precompetitive state anxiety. At the end of the first meeting, I asked the athlete to complete two questionnaires to assess baseline (pre-intervention) levels of perfectionism and precompetitive state anxiety. I handed her the Child and Adolescent Perfectionism Scale (CAPS; Flett, Hewitt, Boucher, Davidson, & Munro, 1997) and the Competitive State Anxiety Inventory 2C (CSAI-2C; Stadulis, MacCraken, Eidson, & Severance, 2009) with the instruction to complete the CSAI-2C 10 minutes before her next competitive race (e.g., Polman, Rowcliffe, Borkoles, & Levy, 2007), and the CAPS at any convenient time. The collection of this data was facilitated by her parents and returned to me via email in advance of the second session.

My intention behind the use of these measures was to be able to obtain a baseline score and a post-intervention score in order to detect any change in these constructs that may have been playing an important role in the onset of VCD 'attacks'. These specific measures were chosen as they had both been validated for use in the adolescent population. The 22-item CAPS measures self-oriented and socially prescribed perfectionism in youths and has been used extensively in this population (e.g., Essau, Leung, Conradt, Cheng, & Wong, 2008; Nock & Prinstein, 2005; Stornelli, Flett, & Hewitt, 2009). The self-oriented perfectionism subscale contains 12 items (e.g., “When I do something, it has to be perfect” “I get upset if there is even one mistake in my performance”) and the socially prescribed perfectionism subscale contains 10 items (e.g., “My family expects me to be perfect”). Responses are measured on a 5-point Likert scale ranging from 1 (false—not at all true of me) to 5 (very true of me). A selected number of items were re-worded to make them relevant to the sporting environment (e.g., “My teachers expect my work to be perfect” became “My coach expects my performance to be perfect”). The CSAI-2C is a multidimensional measure of

cognitive and somatic state anxiety and self-confidence in sport performance settings. Participants rate each of the 15 items (e.g., “my body feels tense”; “I'm concerned that I'll swim poorly today”; “I'm confident that I'll swim well today”) on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much).

Finally, it is important to note that whilst perfectionist tendencies and pre-competitive state anxiety can be detrimental to performance in their own right, there are links between the two constructs (Deffenbacher, Zwemer, Whisman, Hill, & Sloan, 1986; Juster, Heimberg, Frost, Holt, Mattia & Faccenda, 1996). Individuals with high levels of perfectionist tendencies are often less satisfied with their performance (Frost & Henderson, 1991), experience higher levels of stress and are more likely to be persistently fear failure (Flett, Hewitt, Blankstein, & Mosher, 1991; Frost, Marten, Lahart, & Rosenblate, 1990). The merits of addressing both issues at the same time were therefore of fundamental importance to the success of the intervention.

Case Formulation

The case formulation was informed by the comprehensive assessment of the athlete, gathering data direct from her self-report assessments, her sport-clinical intake protocol, the interviewing of her parents and the data provided to me from the other practitioners within the interdisciplinary team. The assessment of this combined data led to an understanding that the athlete’s high levels of perfectionism (dispositional variable) and pre-competitive anxiety (environmental trigger) were causing emotional and psychological stress which in turn was contributing to, or causing VCD attacks. While the other members of the treatment team were tackling the biology of VCD, it was my role to address the psychosocial processes that led to the condition. The objective of the interdisciplinary treatment team was to help the individual restore her performance in 400m freestyle races to her last recorded personal best time in

order that she may still be considered for selection for Team GB. The planning of the interventions to bring about performance restoration is detailed in the following paragraphs:

Choosing and Planning the Intervention

The selection and planning of the first intervention for this athlete was undertaken in advance of the second meeting "a priori" (Keegan, 2016, p.155). That is to say I based my decision-making on the information I obtained from the sport-clinical intake, and also from the scored CAPS and CSAI-2C questionnaires returned by the athlete's parents. When selecting and planning the interventions to deliver, I opted for a practitioner-led, prescriptive intervention based on a process of systematic decision-making (cf. Keegan, 2016) that involved the careful analysis of the information obtained during the intake process. I designed the first of the interventions to target the athlete's high levels of perfectionist tendencies. Having researched the evidence associated with supporting adolescent clients to reduce their levels of perfectionism, I drafted a plan for the first intervention. My plan was fourfold: (1) To help the athlete identify that their perfectionist tendencies were problematic to (in this case) their athletic performance (e.g., Stoebera, Otto, Pescheck, & Becker, 2007), (2) To facilitate a shift in measures of self-evaluation, (3) To use cognitive restructuring to deal with cognitive inaccuracies such as excessively high standards and highly critical self-evaluation (Kearns, Forbes, & Gardiner, 2007) and (4) To help the athlete develop goals for change (e.g. Shafran, Cooper, & Fairburn, 2002). I chose to include awareness-raising and goal setting components of this plan to help the adolescent athlete take personal control of her interventions and to increase the likelihood of her acceptance of and engagement in the intervention (e.g., Dixon, Holoshitz, & Nossel, 2016).

The second focus of my intervention was aimed at helping the athlete manage her precompetitive state anxiety. Although the breadth of sport psychology interventions for the

management of precompetitive state anxiety is well-documented, understanding the personal and sport-specific variables associated with the individual's competitive state anxiety is of fundamental importance to ensure that the interventions proposed are appropriate for the athlete and for the sport (Mellalieu, Neil, Hanton & Fletcher, 2009). I therefore anticipated that more time was needed with the athlete to further understand her personal sources of precompetitive state anxiety to determine which particular intervention(s) was/were most likely to be successful. Due to the limited time in between the first and second meeting, I discussed my planned interventions with the respiratory consultant, speech and language therapist and general practitioner four days before the next appointment in order to ensure that the support I was planning on providing was complementing the approach of the other specialists.

The second meeting with the athlete was dedicated to developing a more in-depth understanding of the manifestations of her competitive state anxiety. During this session, the athlete revealed that she experienced high levels of "worry" and somatic anxiety up to a day before a competition which led her to examine ways in which she might avoid competing. She also confirmed that her somatic symptoms were mostly centred on her upper airways where she reported experiencing a dry mouth, coughing, and tightness in drawing breath. Overall, she suggested that these symptoms were mostly present when she was competing nationally, but also when there was a perceived expectation from parents and coaches that she should beat a certain opponent (even at lower level galas). The somatic anxiety symptoms reported were consistent with those of VCD (e.g., Banez & Culbert, 2005), and therefore, I anticipated, would be likely to respond to relaxation interventions such as progressive muscular relaxation and diaphragmatic breathing techniques (Banez & Culbert, 2005). Consideration of appropriate interventions to tackle the "worry" or cognitive component of

competitive state anxiety included cognitive restructuring, coping support, goal-setting, imagery, rational-emotive therapy, and self-talk (e.g., McCarthy, Jones, Harwood, & Davenport, 2010; Neil, Mellalieu, & Hanton, 2006; Rumbold, Fletcher & Daniels, 2012). I decided that the goal-setting intervention already proposed to address the perfectionism construct would be extended to attempt to reduce the cognitive component of precompetitive state anxiety, and would be specifically designed to help the athlete *and her parents* shift their focus from the outcome of races (win versus loss) to the process (start, stroke rate, turns, breathing, catch etc). In addition to the goal-setting intervention, I planned to teach the athlete how to use motivational-general affective imagery (e.g., Hall, Mack, & Paivio, 1998) to help manage her emotions and arousal levels that underpinned her precompetitive anxiety (e.g., Cumming & Williams, 2012). During the intake process, the athlete admitted that her use of psychological skills was poor, and that she would be open to learning how to use appropriate techniques. As the athlete was not an experienced user of imagery, I helped her develop an initial imagery script (session 6) using the PETTLEP model (Holmes & Collins, 2001), employing only sights, feelings and sound modalities to begin with. I followed the recommendations of Orlick (2007) and Williams, Cooley, Newell, Weibull and Cumming (2013) for shorter, higher quality imagery sessions that could gradually be increased in length as the athlete becomes more accustomed to imagery. Following the guidance provided by Williams et al., (2013), the imagery script contained content designed to encourage the facilitative interpretation of precompetitive anxiety. For example: “You have experienced these feelings in the past and have performed well ... therefore you know that you are ready to perform well again today.” The athlete practised using the short imagery script and provided feedback on how it should evolve. The script was refined in session 7 and practiced within and outside of the remaining scheduled sessions.

Prior to the commencement of the delivery of the planned sessions with the athlete, the final plan was discussed via conference call with the rest of the interdisciplinary medical team. It was at this stage that the speech and language therapist confirmed that part of her remit was to work with the athlete to develop awareness of tension in the respiratory system in order to adapt breathing behaviours before becoming symptomatic. Progressive muscular relaxation was an exercise that the speech and language therapist was proposing to use. Furthermore, the focus on gaining control over breathing was ultimately designed with a relaxation effect in mind, and hence, I removed this from my planned sessions. During this conference call, I took the opportunity to further clarify where each team member's responsibilities existed to reduce the likelihood of a further conflict or duplication of effort. Table 1 summarises the division of responsibility of each team member treating the athlete at the centre of this case:

Table 1

Division of responsibility of the team treating the client with VCD

	General Practitioner	**Respiratory Consultant**	**Speech & Language Therapist**	**Sport Psychology Practitioner**
Primary role	First point of contact locally for client.	Leads the examinations for VCD (nasendoscopy, spirometry, x-rays) and reviews medication regime (if appropriate).	Teaches client techniques to relax the upper airway and control the laryngeal area utilising techniques commonly used in voice therapy.	Responsible for identifying emotional and psychological stressors causing VCD.
Additional role	Co-ordinates the care required from Respiratory Consultant, speech and language	Provides VCD diagnosis.	Helps educate the client in identifying and reducing excessive tension associated with respiration.	Designs interventions to help athlete to mitigate and cope with the effect of the identified stressors.

	therapist & sport psychology practitioner			
Additional role	Can prescribe medication (if required).	Overview of client from a respiratory perspective.	Helps client adapt breathing behaviour.	Helps athlete challenge and adapt feelings, thoughts and behaviours.

The meetings I had with the athlete lasted between, an hour and an hour and a half, and were scheduled on a weekly basis at various locations according to the needs of the athlete. The sessions were scheduled in this manner to ensure sufficient momentum, with a fortnightly update with the rest of the treatment team. The team updates were conducted using conference calls or emails depending on the availability of the other members. With the athlete's permission, I updated the treatment team on the work we were doing together, and her reported progress. They provided the same.

Table 2 summarises the nine-week sport psychology-focused intervention programme designed to complement the interdisciplinary approach to the treatment of the athlete's VCD, along with the frequency of team updates:

Table 2

Intervention plan

Sessions	**1** ↓	**2** ↓	**3**	**4** ↓	**5**	**6** ↓	**7**	**8** ↓	**9**
Perfectionist tendencies	Initial meeting & needs analysis	Examples of where perfectionist tendencies were harmful to performance	Examples of where perfectionist tendencies were harmful to performance	Exploring other ways of evaluating the self	Exploring other ways of evaluating the self	Dealing with cognitive inaccuracies	Dealing with cognitive inaccuracies	Goal setting for behaviour change	Goal setting for behaviour change
Competitive state anxiety		Further information gathering	Discussion re experiences of precompetitive anxiety	Shifting evaluation from outcome to process	Shifting evaluation from outcome to process	Developing imagery scripts	Refining imagery scripts	Practicing using imagery	Practicing using imagery

**Arrows indicate the timing of team updates*

At the end of the 9-week programme, the athlete was asked to complete the CSAI-2C (at her next competition) and the CAPS to determine whether there had been any change in levels of precompetitive state anxiety or perfectionist tendencies. To ensure consistency, the pre- and post-intervention questionnaires were completed under similar circumstances to the pre-intervention questionnaires. For the post-intervention CSAI-2C, she completed this ten minutes before her first competition after the 9-week intervention period. Her parents scanned and returned both questionnaires to me via email.

Evaluation of Intervention Efficacy

In evaluating this intervention in the case of the 15-year-old swimmer with VCD, there were several factors to examine. The first, quantitative outcome measure was the difference in the CSAI-2 and CAPS scores after nine weeks of intervention (see Table 3 & 4):

Table 3

Pre- and post-intervention & normative CAPS scores

	Pre-intervention	Post-intervention	Difference	Normative data	Difference post - intervention
Self-orientated	50	37	-13	35.57	+1.43
Socially prescribed	35	28	-7	25.07	+2.93

Table 4

Pre- and post-intervention CSAI-2C scores

	Pre-intervention	Post-intervention	Difference
Somatic anxiety	18	12	-6
Cognitive anxiety	17	12	-5
Self-confidence	5	10	+5

The tables above show a reduction across both subscales of the CAPS and reductions across all three subscales of the CSAI-2C, indicating that the individual's levels of perfectionist tendencies and precompetitive anxiety had reduced over nine weeks. In comparing the athlete's CAPS post-intervention scores with normative data for her age group (e.g., Flett et al., 1997; Smith, Smoll, Cumming, & Grossbard, 2006), both her levels of perfectionist tendencies are still slightly higher than the average, although the normative data provided does not reflect an elite athletic population. In summary, the reduction in scores across both questionnaires indicated a significant improvement. The athlete suggested that she was committed to continuing to use psychological skills in her daily training regime to reduce her perfectionist tendencies and precompetitive anxiety levels further. In addition, first-hand observation of the athlete's performances towards the end of the intervention indicated that there was a change in behaviour and body language during competition, compared with the accounts provided by the athlete's parents, pre-intervention. The athlete appeared to be more confident, and to be involved in more preparation in advance of her event(s) than previously described. In addition, the athlete reported consciously revisiting her goals prior to her events, to employing imagery before her race(s) and instigating breathing exercises taught to her by the speech and language therapist. She explained how she felt more prepared, and more in control of her performance. Ultimately, through the interventions, the aim was to ensure that the athlete could continue to compete at the highest level whilst controlling any symptoms of VCD and therefore no outcome goal was set that linked to race times or personal bests. The athlete, her coach and her parents all reported that her performance towards the end of the nine weeks of intervention had returned to her pre-VCD levels.

Verbal feedback from the general practitioner, speech and language therapist and respiratory consultant on a conference call at the end of the nine-week sport psychology intervention suggested that they were happy with the athlete's progress. The general practitioner explained how she considered the interdisciplinary approach to treating the VCD had been successful. We reflected on a novel approach to the treatment of a challenging case, with the general practitioner and the respiratory consultant suggesting that for similar cases in the future, the sport psychology support would be sought earlier for the client/patient should budgets allow. In addition, both the athlete and her parents were pleased with the progress made in the nine weeks since I had been a part of the treatment team. As my support to the athlete came to an end, she had managed to compete in a 400m freestyle race at a major competition, posting a time close to her personal best. Although she was still experiencing VCD, the 'attacks' were much less frequent, and when they did occur, she reported feeling more able to control them.

Challenges

One of the most significant barriers to further sport psychology assistance beyond the nine weeks of intervention was cost. The respiratory consultant, speech and language therapist and general practitioner were free services at the point of use under the national health service for citizens of the United Kingdom. Sport psychology services are not covered by the national health service, or in the case of this athlete, her national governing body, and were therefore funded by the athlete's parents. Nevertheless, the purpose of the psychology intervention plan was to help the individual athlete recognise, manage and control perfectionist tendencies and precompetitive state anxiety which was believed to be precursors of her VCD attacks during competition. Whilst to a degree, this was accomplished, on

reflection further sessions may have helped the athlete develop, practice and adapt these techniques for further benefit.

An additional challenge related to the logistics of the fortnightly conference call meetings with geographically disparate treatment team. It was very difficult to schedule conference calls to suit everyone's availability, and as such these meetings were often very brief, or scheduled at unsociable hours. Having said that, our communications were supplemented by email correspondence, especially when I needed further advice or support, or where an update was warranted outside of our scheduled meetings.

Discussion of applied, theoretical and research implications

The aim of this case study was to highlight the role of the sport psychology practitioner, as part of an interdisciplinary team of specialists helping an athlete control or eliminate the symptoms of her VCD as a means of restoring her competitive swimming performances. In support of the BPS' approach to the training of sport psychologists, an exposure to a breadth of roles that can be performed by people practicing the discipline of sport psychology is fundamental for professional development (British Psychological Society, 2011). I recommend gaining experience of delivering sport psychology support as part of an interdisciplinary team of individuals supporting an athlete. Indeed, future research would benefit from investigating how the function of interdisciplinary teams may be enhanced. Themes such as leadership, communication, the maintenance of confidentiality, working within and across professional, ethical, geographical, organisational and cultural boundaries all provide worthwhile avenues of investigation.

Recommendations to practitioners and students

On reflection of my experiences of working as part of an interdisciplinary team to support an athlete with VCD, I make the following recommendations: Firstly, it is important

for practitioners to have an awareness of VCD as psychophysiological condition that may be responsible for performance decrements in sport. Being familiar with this condition, may help expedite accurate diagnosis and referrals for athletes with unexplained breathing complaints. Secondly, practitioners may benefit from using the sport-clinical intake protocol (Taylor & Schneider, 1992) as a means of needs analysis when presenting with unconventional cases, especially when working with athletes to aid performance restoration or to tackle performance dysfunction (e.g., Gardner & Moore, 2005). The sport-clinical intake protocol can help obtain adequate information about the athlete to assist in the preparation of an effective intervention plan or programme (e.g., Taylor & Schneider, 1992). Finally, students and practitioners may benefit from understanding that the roles of specialists working within an interdisciplinary team often overlap, and that careful negotiation of roles and responsibilities will ensure that the athlete is fully supported, without a duplication of effort, or indeed conflicting messages. In such situations, communication is key.

Reflections

My reflections on this case will follow the structure recommended by Gibbs (1998), by outlining a description of what happened, my reactions, an evaluation, analysis, conclusion and action plan. This was my first experience of playing a key role in an interdisciplinary team to help support an elite athlete manage a condition such as VCD. At the time, I had little experience of working alongside general practitioners, speech and language therapist and respiratory consultants, and was unaware of what to expect, and how my involvement would effectively compliment the work undertaken by the other specialists. When I first became involved in this case, I lacked a detailed knowledge of VCD and the manner in which it could impact on athletic performance. As such, I spent a long time talking to the general practitioner and the respiratory consultant about their work with individuals

suffering from this condition from diagnosis, all the way through to how individuals achieved the successful management of their condition. They recommended several useful articles that I could read to enhance my knowledge of the condition, and sent me copies of presentations prepared and case studies of individuals previously treated. In addition, the general practitioner specifically supported the development of my understanding of the condition, and the likely links with precompetitive anxiety. Although at the time of initiating my involvement in this case, I worked hard to gather information on VCD, I was clear at the initial meeting with the client and her parents that this was my first experience of dealing with such a case. They were happy to proceed with my support on this basis, and were aware of the support available to me from the other practitioners on the interdisciplinary team.

One of the major challenges for me as a sport psychology practitioner was to decide how I would approach this case given that I was about to commence work with an athlete who was hoping to merely *restore* their athletic performance. The majority of athletes I work with are looking to enhance their performance, and as such, my "go-to" tool for intake and needs analysis - the performance profile - was unlikely to meet the objectives of the referral. This is where the flexibility of the sport-clinical intake helped. This approach to needs analysis and client intake helped me discover the athlete's perfectionist tendencies, which were in part, driving her precompetitive anxiety, which happened to be a fundamental issue that was contributing to her VCD.

The design of the intervention was constrained by the limited amount of time I had to work with the athlete due to funding constraints. The limited time available focused the intervention, and potentially the athlete and her parents' engagement in the sessions. In my opinion, by fully involving the parents in the sessions, they were able to reinforce the advice delivered, and encourage the use of psychological skills on a more regular basis in between

sessions (e.g., Roberts, 2015). In hindsight however, more work with the parents of the athlete may have been beneficial since maladaptive perfectionism in children and adolescents is linked to family environments where love and approval is conditional on performance, or where feedback is withheld from the child unless particular standards are met (Sapieja et al., 2011). In conclusion, the 9-week intervention programme which formed part of an interdisciplinary treatment regime for an elite swimmer with VCD was considered effective, and involved the learning of new skills that enhanced my effectiveness as a practitioner. Given the lessons I have learned from this case, I am aiming to extend my practice to incorporate psychological support to athletes at all levels with a VCD diagnosis.

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