QUALITY IN SPORT
eISSN 2450-3118 · Open Access · Peer-reviewed
apcz.umk.pl/QS Nicolaus Copernicus University in Toruń

Cite as: DRELICH, Krzysztof, POLCZYK, Jakub, DEPTUCH, Wojciech, MOĆKO, Paweł Krzysztof, GOLIŃSKA, Zofia, ZAJĄC, Maciej Tomasz, RAJZER, Przemysław, RURKOWSKA, Julia, OGORZAŁEK, Filip Maciej and SZCZUCIŃSKI, Wiktor. Cycling-Related Erectile Dysfunction in Men: Evidence on Neurovascular Mechanisms and Prevention. Quality in Sport. 2026;60:72876. https://doi.org/10.12775/QS.2026.60.72876

ARTICLE TIMELINE
Received: 31.05.2026. Revised: 23.06.2026. Accepted: 23.06.2026. Published: 27.06.2026.

The journal has been awarded 20 points in the parametric evaluation by the Polish Ministry of Higher Education and Science (Annex to the announcement of 05.01.2024, No. 32553). Unique Journal Identifier: 201398. Scientific disciplines: Medical Sciences; Health Sciences.
Punkty Ministerialne z 2019 – aktualny rok 20 punktów. Załącznik do komunikatu Ministra Szkolnictwa Wyższego i Nauki z dnia 05.01.2024 Lp. 32553. Posiada Unikatowy Identyfikator Czasopisma: 201398. Przypisane dyscypliny naukowe: Nauki medyczne; Nauki o zdrowiu.

Cycling-Related Erectile Dysfunction in Men: Evidence on Neurovascular Mechanisms and Prevention

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Abstract

Background

Cycling is one of the most popular forms of physical activity worldwide and is associated with multiple cardiovascular, metabolic and psychological health benefits. Despite these advantages, long-duration cycling exposure has also been linked with genital numbness, perineal discomfort and erectile complaints in some male cyclists.

Aim

The aim of this narrative review was to synthesize current evidence on cycling-related erectile dysfunction in men, with a particular focus on epidemiological data, shared neurovascular mechanisms, and preventive or clinical strategies to mitigate cycling-induced genital and erectile symptoms.

Materials and methods

A narrative literature review was conducted using the PubMed database. Publications published between January 1, 2016 and March 31, 2026 were screened using combinations of keywords related to cycling, erectile dysfunction, genital symptoms, saddle pressure and pudendal neuropathy. A total of 67 publications were initially identified. After title and abstract screening, 33 studies underwent full-text evaluation. The final narrative synthesis included 15 studies most closely related to cycling-associated erectile dysfunction, genital symptoms and neurovascular mechanisms.

Results

Current evidence does not support the conclusion that cycling itself is a universal cause of erectile dysfunction. Large observational studies and meta-analyses showed comparable erectile function scores between recreational cyclists and non-cycling controls despite a substantially higher prevalence of genital numbness and perineal symptoms among cyclists. Increased risk of erectile dysfunction was observed primarily in individuals exposed to prolonged riding duration, high cumulative saddle pressure and occupational or endurance cycling.

The proposed mechanisms involve a combination of pudendal nerve compression, transient reductions in penile blood flow and oxygenation, and repetitive microtrauma affecting perineal neurovascular structures. Riding on traditional narrow saddles was associated with marked decreases in penile perfusion, while prolonged uninterrupted saddle contact appeared to increase neurovascular stress.

Several preventive strategies demonstrated beneficial effects. No-nose and anatomically designed saddles reduced perineal pressure and improved penile oxygenation, whereas periodic standing during riding and optimization of bicycle ergonomics were associated with lower prevalence of genital symptoms. Conservative management based on modification of riding habits and bicycle setup remained the preferred approach for symptomatic cyclists.

Conclusions

Cycling remains a generally safe and beneficial form of physical activity for most men. Nevertheless, prolonged endurance riding and unfavourable bicycle ergonomics may contribute to erectile and genital symptoms in

susceptible individuals. Appropriate bicycle setup, early symptom recognition and further prospective studies are needed to better define long-term risk and prevention strategies.

Keywords: cycling; erectile dysfunction; cyclists; genital numbness; pudendal nerve; saddle pressure; perineal compression

1. Introduction

Cycling is one of the most popular forms of physical activity worldwide and is widely recommended because of its beneficial effects on cardiovascular fitness, metabolic health, body composition and psychological well-being (Sgrò & Di Luigi, 2017). Regular physical activity is also associated with improved endothelial function, lower cardiovascular risk and better glycemic control, all of which play an important role in maintaining normal erectile function. Because erectile dysfunction (ED) is strongly linked with vascular and metabolic disorders, moderate recreational cycling may theoretically exert indirect protective effects on male sexual health (Panara et al., 2019).

Despite these benefits, increasing attention has been directed toward possible genitourinary complications associated with repetitive cycling exposure. Unlike many other forms of exercise, cycling involves repetitive and prolonged contact between the perineal region and the bicycle saddle, potentially exposing local neurovascular structures to chronic mechanical stress (Litwinowicz et al., 2021). Symptoms such as genital numbness, perineal discomfort, altered penile sensation and erectile complaints have therefore been increasingly investigated in both recreational and competitive cyclists (Chiaramonte et al., 2021).

Current evidence regarding the relationship between cycling and erectile dysfunction remains inconsistent. Large observational studies demonstrated preserved erectile function scores in many recreational cyclists despite substantially higher prevalence of genital numbness and saddle-related symptoms compared with non-cyclists (Awad et al., 2018; Vieira e Brito et al., 2022). Similarly, a meta-analysis including more than 3300 cyclists did not demonstrate significantly different crude ED prevalence compared with controls, although adjusted analyses suggested higher ED odds among cyclists exposed to cumulative riding duration and cumulative saddle pressure. These findings suggest that cycling itself may not represent an independent universal cause of ED and that symptom development likely depends on riding exposure, bicycle ergonomics and individual susceptibility (Gan et al., 2021).

At the same time, the risk of clinically significant erectile dysfunction appears highly variable between cyclists. Greater symptom burden has been reported in endurance cyclists exposed to prolonged riding duration, high weekly mileage and repetitive uninterrupted seated posture, whereas moderate recreational cycling may not significantly impair erectile function (Balasubramanian et al., 2020; Segura-Arias et al., 2026). Bicycle ergonomics also appear clinically important. Saddle design, handlebar position, trunk inclination and bicycle fitting substantially influence pressure distribution across the perineum and may modify local neurovascular loading during cycling (Vicari et al., 2023).

Several neurovascular mechanisms have been proposed to explain cycling-related genital symptoms. Prolonged saddle pressure may compress the pudendal nerve and surrounding vascular structures, resulting in transient ischemia, altered penile perfusion and sensory disturbances affecting the perineal region (Litwinowicz et al., 2021; Chiaramonte et al., 2021). Experimental studies demonstrated substantial reductions in penile oxygen pressure and penile blood flow during seated riding on narrow traditional saddles, particularly in aggressive forward-leaning posture (Litwinowicz et al., 2021). Repetitive vibration and oscillatory microtrauma generated during cumulative riding on uneven terrain may further aggravate local neurovascular stress (Sanford et al., 2018).

Importantly, erectile dysfunction itself is a multifactorial condition influenced by age, obesity, smoking, hypertension, diabetes mellitus, endothelial dysfunction and psychological factors (Panara et al., 2019). In susceptible individuals, cycling-related perineal compression may therefore represent an additional contributing factor rather than the sole cause of symptoms. Increasing recognition of genital numbness and pelvic discomfort among cyclists has consequently led to growing interest in preventive strategies focused on bicycle ergonomics, riding behavior and reduction of neurovascular compression (Litwinowicz et al., 2021; Molina-Torres et al., 2023).

As recreational and competitive cycling participation continues to increase worldwide, better understanding of the relationship between cycling and erectile dysfunction becomes clinically important for both physicians and athletes.

The aim of this narrative review was to summarize current evidence regarding cycling-related erectile dysfunction in men, with particular focus on epidemiological findings, shared neurovascular mechanisms and current preventive strategies aimed at reducing cycling-related genital and erectile symptoms.

2. Research materials and methods

Given the substantial heterogeneity of the available evidence, a narrative review methodology was adopted. The literature search was performed using the PubMed database to identify studies investigating cycling-related erectile dysfunction, genital symptoms, saddle pressure, and pudendal neurovascular mechanisms. The search focused primarily on studies published between 2016 and 2026.

Search terms included combinations of keywords related to cycling, erectile dysfunction, sexual function, genital numbness, perineal and saddle pressure, penile blood flow, pudendal nerve dysfunction, pelvic floor disorders, and bike fitting.

Relevant publications were selected based on their clinical and scientific relevance to the topic. Priority was given to studies evaluating cycling-related sexual and genitourinary outcomes, neurovascular mechanisms, saddle biomechanics, and preventive strategies. The final narrative synthesis incorporated evidence from observational studies, cross-sectional studies, systematic reviews, meta-analyses, and narrative reviews.

Only English-language studies involving human participants were considered. Studies not directly related to cycling-associated genital symptoms, erectile dysfunction, or neurovascular complications were excluded.

The findings were synthesized descriptively and organized into thematic sections addressing epidemiological evidence, neurovascular mechanisms, and preventive or clinical implications of cycling-related perineal stress.

3. Research results

Current evidence suggests that cycling-related erectile dysfunction is a multifactorial condition involving mechanical compression of the perineum, altered penile blood flow, and potential pudendal nerve irritation. The reviewed literature also highlights the role of cycling exposure, saddle design, riding posture, and preventive ergonomic interventions in modifying the risk of genital symptoms and erectile dysfunction.

The findings are presented in the following thematic sections.

3.1. Cycling and erectile dysfunction

The association between cycling and erectile dysfunction (ED) remains controversial, with current evidence suggesting that the relationship is influenced more by cumulative cycling exposure than by cycling participation itself. A meta-analysis including 3330 cyclists and 1524 non-cycling controls reported nearly identical crude ED prevalence in both groups (56.8% vs. 56.2%) and no significant differences in mean Sexual Health Inventory for Men (SHIM) scores. However, after adjustment for age, hypertension and diabetes, cyclists demonstrated significantly higher odds of ED compared with non-cycling controls (OR = 2.00; 95% CI: 1.57–2.55). Interpretation of these findings is complicated by substantial heterogeneity across the included studies, which evaluated markedly different cyclist populations, ranging from recreational riders cycling only a few hours per

week to occupational cyclists exposed to approximately 9.5 hours of daily riding. This group of occupational cyclists from Kenya represented the strongest signal for increased ED risk. Exclusion of this population reversed the overall association, with cyclists subsequently demonstrating lower odds of ED than controls (OR = 0.69; 95% CI: 0.53–0.90), suggesting that the reported risk may be driven primarily by extreme cumulative saddle exposure rather than recreational cycling (Gan et al., 2021).

This conclusion is supported by additional studies indicating a dose-dependent relationship between riding volume and erectile symptoms. Men cycling more than 3 hours per week demonstrated a greater risk of moderate-to-severe ED, whereas those cycling less than 3 hours weekly appeared to have a lower ED prevalence than non-cyclists (Panara et al., 2019). Similarly, greater urological symptom burden has been reported among cyclists exceeding approximately 8.5 hours of riding per week, although age, vascular comorbidities and bicycle ergonomics appear to remain stronger predictors of erectile dysfunction than cycling exposure alone (Segura-Arias et al., 2026).

A similar exposure-dependent relationship was described in broader reviews evaluating sport and male reproductive health. ED prevalence among male cyclists has been reported in the range of 5–24%, whereas genital numbness appears substantially more frequent, affecting 50–90% of riders in selected groups (Sgrò & Di Luigi, 2017). Genital numbness was additionally estimated to affect approximately 60% of cyclists overall, although recent higher-quality studies do not support a uniformly harmful effect of moderate recreational cycling on erectile function (Panara et al., 2019).

Large observational studies further indicate that genital symptoms do not necessarily translate into measurable erectile dysfunction. In amateur cyclists evaluated using the International Index of Erectile Function (IIEF-5) questionnaire, mean erectile function scores did not significantly differ from those observed in amateur football players despite greater prevalence of genital numbness among cyclists. Mean IIEF-5 scores reached 22.45 in cyclists and 21.70 in football players ($p = 0.071$), while ED defined as IIEF-5 $\leq$21 was present in 37.2% and 26.6% of participants, respectively ($p = 0.164$). At the same time, genital or perineal numbness was reported by 25.1% of cyclists compared with 7.0% of football players ($p = 0.009$), suggesting that sensory symptoms may occur more frequently than clinically significant ED (Vieira e Brito et al., 2022).

Comparable findings were reported in a multinational group including 2774 cyclists and 1158 runners or swimmers (Awad et al., 2018). Mean SHIM scores remained similar between groups and were slightly higher in high-intensity cyclists than in controls (20.7 vs. 19.5). Despite preserved erectile function, cyclists demonstrated markedly higher prevalence of genital numbness and saddle sores. The risk of genital numbness was 6.2 times higher in low-intensity cyclists and 13.4 times higher in high-intensity cyclists. Similarly, saddle sores were approximately 10 times more common among low-intensity cyclists and 26 times more common among high-intensity cyclists compared with runners and swimmers (Awad et al., 2018).

More detailed evaluation of genital numbness demonstrated a strong relationship with cumulative cycling exposure. Increasing years of cycling, greater weekly riding frequency and longer distance per ride were all associated with higher numbness prevalence. The penis represented the most common symptom location (44%), followed by the perineum (31%), scrotum (19%) and buttocks (6%). Most numbness episodes lasted less than one hour, including 28% lasting under one minute and 62% lasting between 1 and 59 minutes. Nevertheless, SHIM scores remained nearly identical in cyclists with and without numbness (20.3 vs. 20.2; $p = 0.83$), even after adjustment for BMI and lifetime cycling mileage (Baradaran et al., 2019).

Not all studies, however, fully separated genital symptoms from erectile dysfunction risk. ED was reported in 22% of cyclists in a cohort analyzed by Balasubramanian et al., while genital numbness and genital pain occurred in 57% and 30% of participants, respectively. Penile numbness was associated with greater ED odds (OR = 1.453), whereas numbness developing within the first hour of riding approximately doubled ED risk compared with symptoms appearing after more than 5 hours (OR = 2.002). Early genital pain demonstrated even stronger associations, with OR values of 2.466 during the first hour and 2.893 after 1–5 hours of riding. Interestingly, total weekly riding time itself was not directly associated with ED, suggesting that individual sensitivity to perineal compression may be more important than mileage alone (Balasubramanian et al., 2020).

The potentially protective role of physical activity should also be considered when interpreting cycling-related ED. Higher movement-based behavior (MBB) scores were associated with lower ED risk in a cohort of 3435 American men analyzed within the NHANES database. Participants with higher (MBB) scores (3–4 points) demonstrated

lower odds of ED after adjustment for confounding variables (OR = 0.61; 95% CI: 0.41–0.90). Walking or cycling also showed a protective trend, although statistical significance became borderline after full adjustment (OR = 0.79; 95% CI: 0.61–1.02; p = 0.07) (Chen et al., 2025).

Taken together, current evidence suggests that cycling-related ED is not a uniform outcome. Moderate recreational cycling does not appear to consistently impair erectile function and may provide indirect vascular and metabolic benefits supporting sexual health. Increased risk appears more likely in cyclists exposed to prolonged saddle pressure, high cumulative riding volume, early genital numbness or pain and additional vascular risk factors.

3.2. Shared neurovascular mechanisms

The pathophysiology of cycling-related erectile dysfunction is considered multifactorial and primarily involves chronic neurovascular compression within the perineal region. Most studies suggest that saddle pressure may impair both penile blood flow and pudendal nerve function, particularly during long-distance riding and aggressive forward-leaning cycling posture (Gan et al., 2021; Sgrò & Di Luigi, 2017).

One of the most frequently described mechanisms is compression of the pudendal nerve within Alcock's canal. During seated riding, the perineum becomes compressed between the saddle and the pubic rami, exposing the pudendal nerve and its branches to repetitive mechanical stress. Chronic compression may lead to genital numbness, paraesthesia, altered penile sensation and neurogenic erectile dysfunction (Sgrò & Di Luigi, 2017; Chiaramonte et al., 2021). In some cyclists, prolonged nerve ischemia may additionally contribute to chronic pelvic pain symptoms and delayed recovery of sensory function (Chiaramonte et al., 2021).

The duration of nerve compression appears clinically important. Transient symptoms developing after shorter rides are often reversible, whereas sustained compression lasting many hours may require substantially longer recovery and may increase the likelihood of persistent symptoms. This may partly explain why genital numbness is relatively common after long rides while clinically significant erectile dysfunction appears less frequent (Chiaramonte et al., 2021).

Vascular impairment represents another major component of the proposed mechanism. Riding on traditional narrow saddles has been associated with marked reductions in penile perfusion and oxygenation, with penile blood flow decreasing by up to 84% and oxygen levels by approximately 72.6% (Sgrò & Di Luigi, 2017; Litwinowicz et al., 2021). In experimental conditions, penile systolic pressure decreased from 126 mmHg to 76 mmHg after only 5 minutes of riding and returned to baseline within 10 minutes after dismounting, supporting the role of transient ischemic during cycling (Litwinowicz et al., 2021). Continuance of exposure may be more important than isolated peak pressure values. Seated position while riding with repetitive compression may progressively impair penile perfusion, especially during endurance cycling characterized by many hours of uninterrupted saddle contact (Vicari et al., 2023). In contrast, standing on the pedals almost completely removes perineal loading and substantially improves penile perfusion, further supporting the central role of saddle compression in symptom development (Vicari et al., 2023).

Pressure distribution across the saddle region also appears highly dependent on anatomy and riding position. Three-dimensional anatomical models demonstrated that the highest-pressure concentrations occur near the pubic symphysis and along the dorsal penile nerve groove, where neurovascular structures are particularly vulnerable to compression (Litwinowicz et al., 2021). Forward trunk inclination and lower handlebar position additionally increase pressure over the anterior perineum and may worsen both vascular and neural compression during prolonged riding exposure (Gan et al., 2021; Segura-Arias et al., 2026).

Beyond static compression, repetitive microtrauma and vibration may additionally contribute to neurovascular injury. Oscillatory forces transmitted through the saddle during riding on uneven terrain increase perineal loading and may progressively damage local nerves and vessels (Sanford et al., 2018). Laboratory simulations demonstrated a nearly linear relationship between vibration amplitude and perineal pressure increase ($r^2 = 0.82$). Under high oscillation exposure, perineal pressure increased by 19.4% during seated riding without pedaling and by 26.9% during pedaling, corresponding to approximately 7–10 kg of additional force transmitted to the perineum in an average cyclist (Sanford et al., 2018).

The potential role of repetitive microtrauma is further supported by findings observed in mountain bikers. Off-road cyclists exposed to uneven terrain and repeated impacts demonstrated substantially higher prevalence of abnormal scrotal and testicular ultrasound findings compared with road cyclists, reaching 94% and 48%, respectively (Segura-Arias et al., 2026). Additional tissue changes associated with cycling were also described in pelvic floor studies. Chronic saddle pressure and repetitive irritation may contribute to fibrosis, skin thickening, chronic perineal pain and altered neuromuscular function of the pelvic floor muscles (Molina-Torres et al., 2023). Authors suggest that chronic microtrauma and repetitive neurovascular compression may contribute to persistent genital symptoms and longer-term alterations in sensory and sexual function among susceptible cyclists (Molina-Torres et al., 2023; Segura-Arias et al., 2026).

Not all proposed mechanisms are exclusively mechanical. Long-term high-volume endurance training may also influence hormonal balance through suppression of the hypothalamic-pituitary-testicular axis. Reduced testosterone concentrations associated with chronic endurance training have been linked with decreased libido, fatigue and impaired sexual function in some athletes, although this mechanism remains less studied specifically in cyclists (Sgrò & Di Luigi, 2017).

Similar neurovascular mechanisms have also been described in female cyclists. In a cross-sectional study including 178 women evaluated using the Female Sexual Function Index (FSFI), genital numbness was reported by 58.1% of cyclists and genital pain by 69.1%. Female cyclists experiencing genital numbness half the time or more demonstrated significantly higher odds of female sexual dysfunction (aOR = 6.0; 95% CI: 1.5–23.6), while genital pain occurring within the first hour of riding was associated with even greater risk (aOR = 12.6; 95% CI: 2.5–63.1). These findings suggest that prolonged perineal loading may adversely affect sexual function through similar neurovascular pathways regardless of sex, further supporting the central role of mechanical compression in cycling-related genital symptoms (Greenberg et al., 2019).

3.3. Preventive strategies and clinical implications

Current evidence suggests that many cycling-related genital and erectile symptoms may be reduced through appropriate bicycle ergonomics, modification of riding habits and early recognition of warning symptoms. Most preventive strategies aim to reduce cumulative compression affecting the pudendal neurovascular structures during seated riding (Sgrò & Di Luigi, 2017; Chiaramonte et al., 2021).

Among currently available interventions, no-nose saddles demonstrated the greatest objective reduction in perineal pressure. Removal of the anterior saddle nose reduced anterior perineal pressure by approximately 63–71% and limited the decrease in penile oxygen levels to around 20%, compared with reductions exceeding 72% during riding on standard saddles (Litwinowicz et al., 2021). Long-term use of no-nose saddles for 6 months reduced the prevalence of urogenital numbness from 73% to 18% and improved erectile function questionnaire scores together with cavernous artery peak systolic velocity measurements (Litwinowicz et al., 2021).

Bicycle ergonomics appear to play a key role in symptom prevention. Wider and anatomically shaped saddles shift body weight toward the ischial tuberosities rather than the soft tissues of the perineum, thereby reducing neurovascular compression and improving penile oxygenation compared with conventional saddle designs (Sgrò & Di Luigi, 2017; Litwinowicz et al., 2021; Vicari et al., 2023). In contrast, lower handlebar position and aggressive forward trunk inclination increase anterior perineal loading and may exacerbate genital symptoms during riding (Vicari et al., 2023; Molina-Torres et al., 2023). Also, suspension seatposts reduced oscillation-related pressure increases by approximately 57–59% under laboratory conditions, suggesting a potential protective effect against cycling-related genital symptoms (Sanford et al., 2018).

Behavioural modifications represent another important preventive approach. Standing on the pedals temporarily eliminates perineal compression and rapidly restores penile blood flow and tissue oxygenation (Litwinowicz et al., 2021). Standing intervals lasting approximately 20–30 seconds every 20 minutes together with regular position changes were repeatedly recommended to reduce uninterrupted neurovascular compression during longer rides (Chiaramonte et al., 2021). Standing on the pedals for more than 20% of total riding time was additionally associated with approximately 60% lower risk of genital numbness (Awad et al., 2018).

Systemic vascular health also remains clinically relevant. Cyclists with obesity, smoking history, hypertension, diabetes mellitus or cardiovascular disease may be more susceptible to erectile symptoms associated with repetitive

saddle compression because of pre-existing endothelial dysfunction and impaired penile perfusion (Panara et al., 2019). These observations suggest that cycling-related erectile complaints should be interpreted within the broader context of overall vascular and metabolic health rather than as an isolated mechanical problem.

Management of cycling-related genital symptoms is primarily based on modification of riding habits and bicycle. When symptoms persist, pharmacological therapy may be used for pain control, although evidence supporting its long-term effectiveness remains limited. Invasive interventions, including pudendal nerve blocks, surgical decompression and selected vascular procedures, are generally reserved for severe cases refractory to conservative management (Chiaramonte et al., 2021).

4. Discussion

The relationship between cycling and erectile dysfunction remains controversial. Although cycling has traditionally been viewed as a potential cause of erectile problems because of prolonged pressure on the perineum, the findings summarized in this review suggest that the issue is more complex. The strongest associations with ED were observed in cyclists exposed to very high cumulative riding volumes, particularly occupational and endurance cyclists (Gan et al., 2021). In contrast, several large observational studies found no significant deterioration in erectile function among recreational cyclists despite a higher prevalence of genital symptoms (Awad et al., 2018; Vieira e Brito et al., 2022).

A recurring finding across the reviewed studies was the mismatch between genital numbness and erectile dysfunction. Numbness was reported much more frequently than ED and was strongly associated with riding exposure, weekly mileage and riding duration (Baradaran et al., 2019). However, erectile function scores often remained unchanged even among cyclists reporting recurrent sensory symptoms (Awad et al., 2018; Vieira e Brito et al., 2022). This suggests that transient neurovascular disturbances may be relatively common during cycling, whereas progression to clinically significant erectile dysfunction is less frequent.

The available evidence points toward a multifactorial mechanism. Both Chiaramonte et al. (2021) and Litwinowicz et al. (2021) highlighted the importance of pudendal nerve compression and temporary reductions in penile blood flow during seated riding. At the same time, studies evaluating mountain bikers and off-road cyclists suggest that repetitive vibration and microtrauma may further contribute to symptom development (Sanford et al., 2018; Segura-Arias et al., 2026). Rather than a single mechanism, cycling-related symptoms probably result from the combined effects of neural compression, vascular compromise and cumulative mechanical stress.

An important observation is that many of these factors appear to be modifiable. Several studies reported improvements in pressure distribution, penile oxygenation and symptom burden following ergonomic interventions such as alternative saddle designs, changes in riding posture or periodic standing during cycling (Litwinowicz et al., 2021; Awad et al., 2018). This may explain why cyclists with similar training volumes often report markedly different symptoms. Bicycle setup seems to play a major role in determining individual susceptibility to neurovascular compression.

The findings should also be interpreted in the context of overall health. Erectile dysfunction is strongly influenced by age, obesity, smoking, hypertension, diabetes and cardiovascular disease, all of which may affect penile blood flow independently of cycling (Panara et al., 2019). It is therefore likely that cycling-related perineal stress acts as an additional factor in susceptible individuals rather than as an isolated cause of erectile dysfunction.

Several limitations of the available literature should be acknowledged. Most studies were cross-sectional and relied on self-reported questionnaires, while definitions of cycling exposure and genital symptoms differed substantially between studies. Objective assessments of penile blood flow, nerve function and long-term clinical outcomes were relatively uncommon. As a result, the true long-term impact of cycling on erectile function remains difficult to quantify.

Overall, the current evidence does not support the view that cycling is an independent cause of erectile dysfunction in most men. Instead, the available data suggest that symptom development depends on the interaction between riding exposure, bicycle ergonomics and individual susceptibility. Further prospective studies using standardized outcome measures and objective neurovascular assessments are needed to clarify which cyclists are at greatest risk and to better define long-term clinical outcomes.

5. Conclusions

Cycling does not appear to be an independent cause of erectile dysfunction in most men. The available evidence suggests that clinically significant symptoms are more likely to occur in cyclists exposed to prolonged riding duration, high cumulative saddle pressure and additional vascular risk factors.

Many cycling-related genital symptoms may be reduced through appropriate bicycle ergonomics and modification of riding habits. Consequently, early recognition of warning symptoms and individualized preventive strategies may help minimize neurovascular complications while preserving the health benefits associated with regular cycling.

Further prospective studies using standardized outcome measures and objective neurovascular assessments are needed to better define long-term risk.

DISCLOSURE

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All authors have read and agreed with the published version of the manuscript.

Funding

This research received no external funding.

Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Data Availability Statement

Not applicable.

Acknowledgements

This research has not received any administrative or technical support.

Conflict of Interest

The authors declare no conflict of interest.

Artificial Intelligence use declaration

Artificial intelligence tools were used solely as a linguistic aid to improve English language clarity and formatting. The scientific content, literature selection, interpretation of results and final manuscript preparation were performed by the authors.

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