

- A – preparing concepts (opracowanie koncepcji i założeń)
B – formulating methods (opracowanie metod)
C – conducting research (przeprowadzenie badań)
D – processing results (opracowanie wyników)
E – interpretation and conclusions (interpretacja i wnioski)
F – editing the final version (redakcja ostatecznej wersji)

The effectiveness of McKenzie Method in diagnosis and treatment of low back pain – a literature review

Skuteczność metody McKenziego w diagnostyce i leczeniu bólów odcinka lędźwiowego kręgosłupa na podstawie przeglądu piśmiennictwa

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Abstract

Introduction: As many as 80% of adults suffer from low back pain. Therefore, it is significant to develop an effective and reliable method of diagnosing and treating low back pain. One of the rehabilitation methods is a mechanical diagnosis and therapy method developed by Robin McKenzie.

The aim of the study was to review the publications assessing the effectiveness of McKenzie Method in diagnosis and therapy of low back pain and to compare it with other widely applied physiotherapeutic methods.

Material and methods: The analysis included 50 articles from the last 20 years dealing with the issue of diagnosis and therapy of low back pain with the use of McKenzie Method. After the application of inclusion criteria, 22 publications were taken into account in the final analysis. The following databases were used: Google Scholar, PubMed, the Library of the Centre of Postgraduate Medical Education and the Main Medical Library.

Results: The research revealed high effectiveness of McKenzie Method in diagnosing pain depending on the level of qualifications of therapists applying this method. It was concluded that McKenzie Method is an effective solution in low back pain therapy as it produced better results than standard rehabilitation and similar results to other therapeutic methods.

Conclusions: A complete training regarding this method is significant for achieving high effectiveness of diagnosis. The combination of McKenzie Method with other forms of therapy gave the best results in improving spinal mobility and general quality of life as well as reducing the level of disability.

Key words: low back pain, centralization, diagnosis, disc herniation, McKenzie Method

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Streszczenie

Wstęp: Bóle odcinka lędźwiowego kręgosłupa dotyczą nawet 80% osób dorosłych, dlatego też istotne jest opracowanie skutecznej i powtarzalnej metody diagnostyki oraz terapii bólów odcinka lędźwiowo-krzyżowego. Jednym ze sposobów rehabilitacji jest metoda mechanicznego diagnozowania i terapii opracowana przez Robina McKenziego.

Celem pracy było dokonanie przeglądu literatury oceniającej skuteczność metody McKenziego w diagnostyce oraz leczeniu dolegliwości bólowych odcinka lędźwiowo-krzyżowego kręgosłupa oraz porównanie metody McKenziego z innymi powszechnie stosowanymi metodami fizjoterapeutycznymi.

Material i metody: Dokonano analizy 50 artykułów z ostatnich 20 lat z zakresu diagnostyki oraz leczenia dolegliwości bólowych odcinka lędźwiowego kręgosłupa metodą McKenziego. Po zastosowaniu kryteriów wyłączenia do ostatecznej analizy użyto 22 publikacje. Wykorzystano bazy: Google Scholar oraz PubMed, Biblioteki Centrum Medycznego Kształcenia Podyplomowego oraz Głównej Biblioteki Lekarskiej.

Wyniki: Badania wykazały wysoką efektywność metody McKenziego w diagnostyce zespołów bólowych, zależną od poziomu kwalifikacji terapeutów zajmujących się metodą McKenziego. Metoda McKenziego okazała się być skutecznym rozwiązaniem w leczeniu dolegliwości bólowych odcinka lędźwiowo-kręgosłupa, osiągając lepsze wyniki niż standardowa rehabilitacja oraz porównywalne rezultaty z innymi metodami terapeutycznymi.

Wnioski: Istotne jest pełne szkolenie w metodzie by uzyskiwać wysoką skuteczność diagnozy. Połączenie metody McKenziego z innymi terapiami dało najlepsze efekty w poprawie ruchomości kręgosłupa, ogólnej jakości życia pacjentów oraz zmniejszaniu poziomu niepełnosprawności.

Słowa kluczowe:

ból odcinka lędźwiowego, centralizacja, diagnostyka, dyskopatia, metoda McKenziego

Introduction

Back pain caused by degenerative changes is experienced by as much as 70% of the population. In approximately 20-60% of these individuals, this pain is chronic [1,2]. It results in long-term disability which generates considerable costs of treatment in the national budget [3]. The occurrence of specific, neuropathic pain is a significant aspect of chronic syndromes of the sacro-lumbar region. It results from damage and compression of neuron or pathological changes in neurons itself. The pain may continue even when the causes disappear [4]. The treatment of neuropathic pain still remains a serious challenge. In Poland, chronic back pain syndromes are the reason for 30% of all the short and long term disabilities [5]. This problem is more and more common among young individuals who are professionally active [1,6]. Pharmacological treatment addresses only symptoms and carries a risk of overdose by a patient leading to adverse effects. Surgical treatment usually brings good results but approximately 18% of the patients required second

surgery [1]. Recurrence of complaints following the surgery is, to a large extent, caused by lack or limited activity of a patient after the operation [6,7]. Conservative treatment based on physiotherapy is the safest alternative for patients. Its effectiveness depends on an accurate and reliable diagnosis, on the basis of which a proper therapy can be implemented [8].

There are numerous physiotherapeutic methods which treat low back pain, e.g. classical physiotherapy based on therapeutic exercises, massage, physical therapy modalities, McKenzie Method, manual therapy, chiropractic manipulation, back school, etc. Finding an effective form of therapy is very difficult and, therefore, it is significant to conduct clinical research on the effectiveness of the therapies taking into account numerous aspects of a patient's health and level of fitness. McKenzie Method, also known as Mechanical Diagnosis and Therapy Method, is based on the analysis of pain patterns and mechanical factors bringing about back pain. The patient examination involves a structured interview and detailed evaluation during which

single and then repeated movements in different directions and with different starting positions are performed. The therapist is constantly monitoring the symptoms and classifies the patient syndrome. McKenzie Method highlights the value of teaching the patient to deal with everyday back pain [10, 11].

The aim of the study was to assess the effectiveness of McKenzie Method in diagnosis and therapy of low back pain and to compare it with other widely applied physiotherapeutic methods on the basis of the literature review.

Material and methods

The analysis included articles from the last 20 years dealing with the issue of diagnosis and therapy of low back pain with the use of McKenzie Method. The following databases were used: Google Scholar, PubMed, the Library of the Centre of Postgraduate Medical Education and the Main Medical Library. The review included 50 articles, out of which 22 publications were

taken into account in the detailed analysis. The following key words were applied: centralization, derangement syndrome, disc herniation, low back pain, McKenzie classification, McKenzie diagnosis, McKenzie method, peripheralization.

Results

The study revealed high effectiveness of McKenzie Method in diagnosing pain syndromes (according to McKenzie classification), lumbar lateral shifts, clinical relevance of lateral shifts (influence of lateral shift on particular symptoms), centralization (the migration of symptoms from a distal location towards the spine) and directional preference (towards centralization) as well as finding differences in the level of qualifications of therapists using McKenzie Method [12–16]. The results of the analysed studies on the reliability and validity of diagnosis according to McKenzie Method are presented in table 1.

Tab. 1. Reliability and validity of diagnosing pain syndrome, relevance of lateral shift, centralization and directional preference according to McKenzie Method

	Razmjou [12]	Kilpikoski [13]	Morko [14]	Werneke course A+B [15]	Werneke course C [15]	Werneke course D [15]	Donahue [16]
Study participants (n)	-	39	30	1587			49
Number of therapists/ years of experience	2 (12 and 24 years)	2 (mean - 5 years)		47 (mean - 14 years)			-
Syndrome diagnosis	93%	95%	75%	87%	91%	86%	-
The occurrence of lateral shift	78%	77%	-	91%	91%	90%	43%
Clinical relevance of lateral shift	98%	85%	-	-	-	-	-
Centralization	-	95%	-	81%	79%	72%	-
Directional preference	-	90%	100%	82%	77%	77%	-

The studies comparing McKenzie Method with selected therapeutic methods according to the Roland-Morris Disability Questionnaire (RMDQ) revealed that when an average level of disability was diagnosed in patients prior to the therapy, a low level of disability was noted after the implementation of McKenzie Method, back school, chiropractic manipulation and educational booklet [17-19]. Moreover, in case the level of disability was low

before the implementation of McKenzie Method and manual therapy, it disappeared after both therapies were applied [20]. The results achieved after the implementation of McKenzie Method were similar to the results obtained by means of other methods. The comparison of McKenzie Method and selected therapeutic methods according to the Roland-Morris Disability Questionnaire (RMDQ) is presented in table 2.

Tab. 2. Assessment of disability level before and after the application of McKenzie Method assessed with the Roland-Morris Disability Questionnaire. 0-3 – lack of disability, 4-10 – low level of disability, 11-17 – average level of disability, 18-24 – high level of disability

		R-M before the therapy	R-M after the therapy	R-M after 3-4 weeks	R-M after 8 weeks	R-M after 3 months	R-M after 6 months
Garcia [17]	McKenzie	11.32	-	6.20	-	7.12	6.77
	Back school	11.08	-	8.15	-	8.39	8.12
Machado [18]	McKenzie	13.70	8.40	4.60	-	-	-
	First-line care	13.50	9.00	4.50	-	-	-
Paatelma [20]	McKenzie	9.00	-	-	-	1.00	0.00
	Manual therapy	9.00	-	-	-	2.00	1.00
	Booklet	8.00	-	-	-	0.00	1.00
Cherkin [19]	McKenzie	12.20	-	4.10	4.10	-	-
	Chiropractic	12.10	-	3.70	3.10	-	-
	Booklet	11.70	-	4.90	4.30	-	-

The study that compared the effectiveness of McKenzie Method and selected physiotherapeutic methods according to Visual Analogue Scale (VAS) revealed a similar decrease in pain after finishing the therapy with the use of McKenzie Method, back school, manual therapy, Mulligan sustained natural apophyseal glides (SNAGS), first-line care and an educational booklet [17,18,20,21]. Worse values

of pain index were noted after the implementation of physical therapy modalities including massage, Transcutaneous Electrical Nerve Stimulation (TENS), laser therapy and stability exercises [22-24]. The comparison of McKenzie Method with selected therapeutic methods according to VAS is presented in table 3.

Tab. 3. Comparison of the effectiveness of McKenzie Method and selected procedures in reducing pain according to VAS, i.e. selected physiotherapeutic methods, first-line care and educational booklet

		VAS before the therapy	VAS after the therapy	VAS after 3 weeks	VAS after 1 month	VAS after 3 months	VAS after 6 months
Garcia [17]	McKenzie	6.77	-	-	4.14	5.18	5.09
	Back school	6.41	-	-	4.39	5.53	5.19
Machado [18]	McKenzie	6.60	3.50	2.00	-	-	-
	First-line care	6.30	3.70	2.30	-	-	-
Paatelma [20]	McKenzie	3.20	-	-	-	1.00	1.00
	Manual therapy	3.50	-	-	-	1.80	1.40
	Educational booklet	3.70	-	-	-	1.70	2.20
Waqqar [21]	McKenzie	9.12	1.46	-	-	-	-
	Mulligan SNAGS	8.85	2.55	-	-	-	-
Probachta [22]	McKenzie	5.60	2.90	-	-	-	-
	Exercises	5.30	3.60	-	-	-	-
Plaskiewicz [23]	McKenzie	6.96	1.48	-	-	-	-
	modalities	7.24	3.00	-	-	-	-
Szulc [24]	McKenzie	6.25	2.05	-	-	2.10	-
	McKenzie + MET	6.35	2.05	-	-	2.00	-
	modalities	5.70	5.25	-	-	5.29	-

The comparison of the effectiveness of McKenzie Method with selected physiotherapeutic methods according to Oswestry Disability Index (ODI) revealed a significant decrease in the results after the implementation of McKenzie Method alone, the combination of McKenzie Method and Muscle Energy Techniques (MET) and Mulligan

SNAGS, while no significant differences were noted after modalities [21,22,24,25]. The results of the comparison according to ODI are presented in table 4.

Tab. 4. Comparison of the effectiveness of McKenzie Method and selected physiotherapeutic methods in reducing disability according to Oswestry Disability Index

		ODI before the therapy	ODI after the therapy	Improvement in ODI
Szulc [24]	McKenzie	28.35	10.90	-
	McKenzie + MET	24.30	9.30	-
	Physiotherapy	31.20	29.20	-
Waqqar [21]	McKenzie	73.82	6.24	-
	Mulligan SNAGS	73.75	7.05	-
Kochański [25]	McKenzie	54.96	10.80	-
	Physiotherapy	59.60	26.56	-
Probachta [22]	McKenzie	-	-	-7.90
	Exercises	-	-	-5.50

Discussion

In the study, articles regarding the application of McKenzie Method in diagnosis and therapy of low back pain were analysed. The study by Razmjou et al. and Kilpikoski et al. focused on the reliability and validity of the method. Both groups of researchers achieved very promising results in classifying patients to particular syndromes, i.e. in the study by Razmjou et al. the reliability was at the level of 97%, while in the research by Kilpikoski et al. it was 74% [12,13]. In the above-mentioned studies, slightly lower reliability was noted as far as lateral shift diagnosis is concerned (78% and 74%, respectively). In turn, Donahue et al. noted a very low level (47%) of intertester reliability regarding the diagnosis of lateral shift. However, it should be pointed out that therapists participating in this research were not qualified in McKenzie Method but underwent only a short training related to lateral shift. The result may have been caused by the lack of qualifications and experience in working with the use of this method [16], which proves considerable significance of training therapists in reaching a proper diagnosis [14,15].

Another issue analysed in our study was the effectiveness of McKenzie Method in treating low back pain compared to other therapeutic methods as well as supported with them. Machado and Probachta compared McKenzie Method to standard physiotherapeutic methods (massage, exercises, physical therapy modalities). Both studies produced contrasting results, i.e. in the research by Machado, therapy with the use of McKenzie Method did not bring about better results than standard rehabilitation (apart from the fact that patients sought medical help less frequently), while in the study by Probachta et al., a larger improvement in the disability level,

pain level and the speed of recovery to professional life were noted in the case of McKenzie Method [18,22]. Among Polish researchers, Kochański et al. assessed the effectiveness of this method in dealing with back pain and noted higher effectiveness of McKenzie Method in reducing the disability level than physical modality modalities [25]. While comparing McKenzie Method with classical rehabilitation in terms of an improvement in the spinal range of mobility and pain level, Plaskiewicz noted a considerable advantage of the first method [23].

The research carried out by Hosseinifar et al., which compared McKenzie Method with stability exercises, revealed higher effectiveness of stability exercises in reducing disability, while a decrease in pain remained at a similar level [26]. In their study, Petersen et al. compared McKenzie Method with dynamic strengthening exercises. The results were similar for both methods, while the application of McKenzie Method generated better results in reducing pain [27].

Petersen et al., Paatelma et al. and Cherkin et al. compared McKenzie Method with manual therapy and an educational booklet; however, in Petersen's study, McKenzie Method supported the other two therapeutic methods. Another crucial difference was constituted by the fact that only patients with symptoms of peripheralization or centralization (peripheralization – the migration of symptoms in the distal direction and their intensification, centralization – the return of pain symptoms from the distal part towards the spine as a result of repositioning of intervertebral disc within the fibrous ring) participated in the study conducted by Petersen. Neither in the study by Cherkin et al. nor in the research by Paatelma et al. was there any statistically significant difference between

manual therapy and McKenzie Method. However, in both studies the results were better than in the case of patients who used an educational booklet only. In his study, Petersen revealed slightly higher effectiveness of McKenzie Method. However, it could have been affected by the selection of patients, as the phenomenon of centralization is a good prognostic in patients undergoing therapy with the use of McKenzie Method [19,20,27].

Garcia et al. compared McKenzie Method with back school. Both groups achieved a significant improvement in the level of disability compared to the control group and, what is significant, this improved level was retained for the next 6 months. However, no differences regarding the level of pain were noted after the application of these methods [17]. In turn, Waqqar et al. compared McKenzie Method with one of Mulligan's therapeutic methods. They revealed higher effectiveness of McKenzie Method in reducing pain and disability level. However, patients undergoing the therapy with Mulligan SNAGS achieved a higher increase in all the spinal ranges of motion [21].

Szulc et al. as well as Mbada et al. adopted a different approach than the previously cited researchers. They examined the effectiveness of McKenzie Method supported with other therapeutic methods. Szulc et al. applied MET described by Chaitow, while Mbada et al. implemented static and dynamic strengthening exercises. Supporting McKenzie Method with MET mainly led to an increase in the mobility of the segments of the spine. The application of both static and dynamic strengthening exercises led to an improvement in the level of disability, while adding dynamic exercises only significantly improved the quality of life. However, the patients' level of pain was similar to the one noted in the case of the implementation of McKenzie Method only [24,28].

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Compared to physical therapy modalities, McKenzie Method produced better results in the majority of cases. The desired therapeutic effect was not achieved only in the research by Machado et al. [18]. Compared to other therapeutic methods, such as manual therapy, back school or Mulligan SNAGS, McKenzie Method gave similar results. Only in the group of individuals performing stability exercises, did the level of disability improve more than in the group undergoing therapy with McKenzie Method. However, compared to strengthening exercises, McKenzie Method led to a higher decrease in the level of pain. Compared to manual therapy, back school and Mulligan SNAGS, a decrease in the level of pain was very similar, while slightly bigger reduction in the level of disability brought about by the implementation of McKenzie Method was noted by Waqqar and Garcia [16,20]. In Petersen's study, McKenzie Method gave better results than manual therapy; however, it may be related to the profile of patients [28].

Conclusions

1. The study revealed high effectiveness of McKenzie Method in diagnosing patients with low back pain.
2. McKenzie Method proved to be an effective tool for treating low back pain that gave better results than standard rehabilitation.
3. Compared to other therapeutic methods, McKenzie Method gave similar results in reducing pain and disability level and in increasing spine mobility.
4. The best therapeutic results were achieved by combining McKenzie Method with other physiotherapeutic procedures.

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