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Systematic Review

## A systematic review on metformin rational pharmacotherapeutics

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### ABSTRACT

This systematic review of the different and wide-ranged studies on metformin rational pharmacotherapeutics was performed, for a better comprehension of multi-centre maintenance of rational pharmacotherapeutic aspects in the regular anti-diabetic treatment prescribed to the new type II diabetic patients. This systematic review contributed 3729 refined and relevant medical records, among total 4570 records obtained from the study databases search, thus providing a refined qualitatively synthesised conclusive medical research study literature, on metformin rational pharmacotherapeutics.

**Keywords:** Rational pharmacotherapeutics, Systematic review, Metformin

### INTRODUCTION

The clinical research method, termed systematic review, is the way of a detailed, systematic and interpretative method of collecting, assessing and synthesising the various medical evidences, to elaborate the research solution to a well-defined research question, in the form of a well-structured qualitative research analysis.<sup>1,2</sup>

Analysing in consideration of metformin rational pharmacotherapeutics, for the treatment of type II diabetic patients, manifesting fresh symptoms, a sufficiently higher efficacious and safe recovery rate of patients are achieved, in routine anti-diabetic tertiary patient healthcare. Metformin also has an easy availability and quite convenient route of drug administration, with specific appropriateness for the initial and maintenance pharmacotherapy of different types of diabetic type II patients. The main mechanism of action of metformin is the gradual overwhelming of insulin resistance as well as causing hypoglycaemia, by activating the enzyme 5' adenosine monophosphate, which catalyses the activation

of protein kinase. Metformin, as its pharmacological co-therapeutic actions, also stabilises the HbA1c levels, along with reduction in weight, among these patients affected with diabetes associated obesity.<sup>3-15</sup> Several systematic reviews had been conducted on various oral hypoglycaemic drugs, including metformin.<sup>1-15</sup> To further supplement these systematic reviews, with the main objective to understand and illuminate on the perspectives of metformin rational pharmacotherapeutics, this systematic review was conducted. This systematic review of the different and wide-ranged studies on metformin rational pharmacotherapeutics was performed, for a better, clear and complete comprehension of multi-centre maintenance of rational pharmacotherapeutic aspects in regular anti-diabetic treatments prescribed to the new type II diabetic patients.

### Objectives

The objective of this study was to conduct a systematic review on metformin rational pharmacotherapeutics.

## **METHODS**

### ***Study type***

This was a systematic review conducted on metformin rational pharmacotherapeutics, among type II anti-diabetic patients.

### ***Study period***

The study period for this systematic review was 1 year, from February 2021 to April 2022.

### ***Study place***

This systematic review was conducted in the departments of pharmacology, clinical pharmacology and rational pharmacotherapeutics, at Mamata Medical College.

### ***Study materials***

The study materials were pharmacological clinical research database, consisting of global heterogenous research analyses and similar study literature on metformin rational pharmacotherapeutics.

### ***Selection criteria***

The study selection criteria, for this systematic review, were the following.

The inclusion criteria were: the published articles on metformin rational pharmacotherapeutics; the original research studies, systematic reviews, meta-analyses, case reports, case series, narrative reviews, study series, parallel studies and similar kind of studies or reviews, of any or all types, which were either qualitative, or quantitative, or both qualitative as well as quantitative; the publication time-frame was chosen to be within a span of the past 3 years; any or all types of observational, descriptive and analytical research studies; and studies performed on any gender of patients.

The exclusion criteria were: irrelevant studies; studies older than 3 years; and the studies which were not based on the specific topic of metformin rational pharmacotherapeutics.

### ***Study procedure***

The study was conducted in accordance with the preferred reporting items for systematic reviews and meta-analyses (PRISMA) statement and guidelines, 2009, described by the Cochrane collaboration in June 2016.<sup>1,2</sup> At first, the records were identified through database searching and the additional records which were identified through other sources. During this procedural step, any or all types of original research studies, systematic reviews, meta-analyses, case reports, case series, narrative reviews, study series, parallel studies and similar kind of studies or

reviews, which are either qualitative, or quantitative, or both qualitative as well as quantitative, in their description of the investigative topic, were thoroughly analysed, with statistical interpretations. Then, the irrelevant records were removed from the screened records. From these screened records, few records were excluded, as per the exclusion criteria. After that, the selection criteria were examined for determining eligibility.

The full text articles were assessed for eligibility, from which few full text articles were excluded, according to the exclusion criteria, with adequate reasons for exclusion. Then, the studies were included in the qualitative synthesis of a systematic review, according to the inclusion criteria. After examining the relevance of the full articles, the medical data and evidences were independently obtained, using forms containing different determinant criteria of analyses, based on well-defined objectives, which were subsequently reviewed, to refine the medical databases and evidences, after elaborate multi-directional assessments. The medical data and evidences were extracted from the study resources, of heterogenous qualitative or quantitative nature, or both. Studies with any or all types of study characteristics and outcomes were obtained to derive the pertinent descriptive or analytical study literature, and subsequently certain selective investigative and experimental elucidations were chosen for elaboration, from the comprehensive review compilation of the published articles, to corroborate the analytical review of the clinical research study literature, databases and evidences on the analytical topic, which finally directed itself towards a well-structured comprehensive research interpretation of the overall study results, for a final specific conclusion. Ultimately the studies were included in the qualitative synthesis. Therefore, by this systematic review, from the total initial study databases search records, the refined and relevant medical records were obtained, for the final analyses and interpretations.

### ***Ethical approval***

The study did not involve any human or animal subjects; therefore, it did not require any ethical approval, and was, therefore, exempted from ethics review.

### ***Statistical analysis***

The systematic review was statistically analysed, step-wise, with numerical calculations, in accordance with the PRISMA statement and guidelines, 2009, described by the Cochrane collaboration in June 2016.

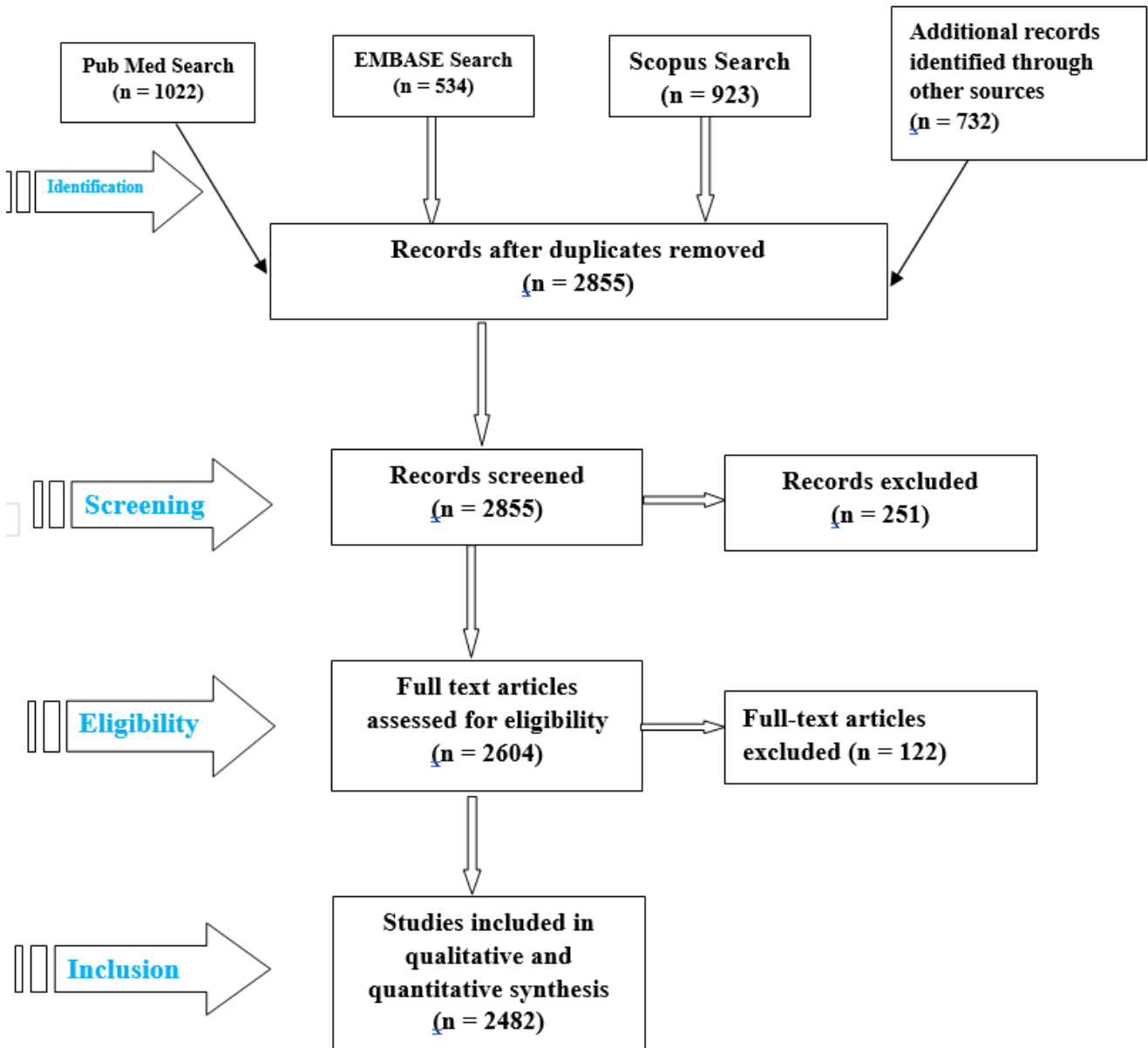
## **RESULTS**

In this systematic review, the study literature search on metformin rational pharmacotherapeutics, contributed total 4570 records. From these 4570 records, 395 irrelevant records were removed. The total number of records, after removing these irrelevant records, were 4175. The records

screened were 4175, from which 289 records were excluded, according to the exclusion criteria.

Thus, the full text articles assessed for eligibility were 3886, from which 157 full text articles were excluded, according to the exclusion criteria. The records ultimately included in the qualitative synthesis, according to the

inclusion criteria, was 3729. These 3729 records were the refined contributions of this systematic review. Thus, this systematic review contributed 3729 refined and relevant medical records, among total 4570 records obtained from the study databases search.



**Figure 1: The stages in PRISMA (preferred reporting items for systematic reviews and meta-analyses) statement and guidelines, 2009.**

**DISCUSSION**

In this evidence-based systematic review, the study literature search on metformin rational pharmacotherapeutics, contributed total 4570 records.

From these 4570 records, 395 irrelevant records were removed. The total number of records, after removing these irrelevant records, were 4175. The records screened were 4175, from which 289 records were excluded, according to the exclusion criteria.

Thus, the full text articles assessed for eligibility were 3886, from which 157 full text articles were excluded, according to the exclusion criteria. The records ultimately included in the qualitative synthesis, according to the inclusion criteria, was 3729. These 3729 records were the refined contributions of this systematic review. Thus, this systematic review contributed 3729 refined and relevant medical records, among total 4570 records obtained from the study databases search.

Thus, this systematic review had the merits that the reviewing was done with a well-organised methodology, along with thorough explanations and analyses of the medical study literature and evidences, compiled from the numerous studies conducted, which authenticated the research question of this systematic review, regarding the oral hypoglycaemic rational pharmacotherapeutic applications of metformin. There were no limitations in this study.<sup>3-15</sup>

Therefore, this systematic review provided the refined qualitatively synthesised medical records, study literature and databases on metformin rational pharmacotherapeutics, with well-comprehensible quantitative analytical interpretations, which is certainly a comprehensive progress towards future innovations in more effective anti-diabetic pharmacotherapeutics research.

## CONCLUSION

To conclude, this systematic review contributed 3729 refined and relevant medical records, among total 4570 initial records, obtained from the study databases search analysis.

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