Review Article

A Review on Different Polyherbal Formulation Combinations Used in the Treatment of Diabetes

Kolhe Rohini C.*[1], Dr. Chaudhari Rajesh Y.[2]

1. SJVPM'S Rasiklal M. Dhariwal College of Pharmacy, Chinchwad-19, Maharashtra, India.

2. T.V.E.S. Hon. Loksevak Madhukarrao Chaudhari College of Pharmacy, District- Jalgaon, Maharashtra-425503, India.

***Corresponding author's E-mail:** rohini.kolhe@gmail.com

Received: 15-05-2019; **Revised:** 23-06-2019; **Accepted:** 02-07-2019.

ABSTRACT

Herbal medicine is the use of herbs and medicinal plants as the first medicine is a universal phenomenon. They can provide a better quality of life. Herbs are just as effective as drugs but without the side effects. Natural herbs and medicines are nature best gift to mankind and there is a lot still to be learned about them. Poly herbal combinations are effective as single herbs. In Indian medicine Ayurveda, most of the classical preparations are poly herbals with a combination of three to thirty plants. These combinations are made for the accuracy and are combined in such a way that the formula is a balanced one. On or two plants in these combinations will be active and the others will be having a supporting role. The present study has been carried out to review the antidiabetic potential of some medicinal plants and the anti-diabetic activity of their polyherbal formulation in diabetic rats.

Keywords: Diabetes mellitus, Antidiabetic, Poly herbal formulations, Polyherbalism.

INTRODUCTION

Diabetes mellitus weather it is insulin-dependent or non-insulin dependent, is a common and serious metabolic disorder throughout the world. Traditional plant treatments have been used all over the world for the treatment of diabetes mellitus. Among many medications and polyherbal plants, numerous herbs have been known to cure and control diabetes; additionally, they don't have any side effects. Diabetes mellitus is a dreadful disease found in all parts of the world and is becoming a serious threat to mankind health.[1]

Formulations containing more than 2 herbs are called polyherbal formulation. Drug formulation in Ayurveda is based on 2 principles: Use as a single drug and use of more than one drug. The idea of polyherbalism is tricky to explain in term of modern parameters. The Ayurvedic literature Sarangdhar Samhita highlighted the idea of polyherbalism to attain greater therapeutic efficacy. [2]

Plants are a potential source of anti-diabetic drugs which can be proved by the ethnobotanical information reports about 800 plants that may possess anti-diabetic potential. Though, synthetic oral hypoglycemic agents/insulin is the typical treatment of diabetes and effective in controlling hyperglycaemia, they have more side effects and fail to significantly modify the course of diabetic complications. This forms the reason for a growing number of people finding alternating therapies that may have less severe or no side effects.[1]

In the rising countries great task is to tackle increased cost of medicine and their side effects. The scientific advancement carries with it the improvement in polyherbal formulations, through the study of various phytoconstituents and discovery of useful herbs combinations which work synergistically to produce desirable effect. Although polyherbal formulation is commonly used in many parts of the world, but scientifically it has not been explored.[2] The review is the attempt to compile data on polyherbal formulation studies against diabetes.

Evaluation of Polyherbal formulation

Diabetes can be induced by different pharmacological, surgical or genetic influences in a number of animal species. Most of the experiments are carried out on rodents, although some studies are still performed in larger animals like rabbits and dogs.[3] The majority of studies published engaged with Streptozotocin induced and alloxan induced models which are the most frequently used model for the study of multiple aspects of the diabetes. Both drugs administered parenterally viz. intravenously, intraperitoneally or subcutaneously to exert their diabetogenic action. The dose of these agents required for inducing diabetes depends on the animal species, route of administration and nutritional status.[4,5]

Table 1: Composition of Antidiabetic Polyherbal formulation

Composition of polyherbal formulation	Solvent for Extract	Method of extraction	Experimental model	Ref
Eugenia jambolana, Momordica charantia, Ocimum sanctum	Hydroalcoholic extract	Soxhlet	Alloxan induced diabetes model	6
Phyllanthus emblica and *Annona squamosa*	Aqueous	Decoction	Streptozotocin diabetes induced model	7
Eugenia jambolana, Gymnema sylvestre, Momordica charantia, Andrographis paniculata, Myristica fragrans	Hydroalcoholic extracts	Triple maceration	Streptozotocin induced diabetes model	8
Ricinus Communis, Tribulus terrestris and *Piper nigrum*	Ethanol	Cold maceration	Alloxan induced diabetes model	9
Annona squamosa, Psidium guajava, Tenospora cardifolia, Bougain villia, Aegle marmelos, Terminalia chebula, Ficus carica, Emblica officinale, Hybiscus rosasinensis, Cassia auriculata and *Zingiber officinale*	Aqueous	Decoction	Alloxan induced diabetes model	10
Schrebera swietenoides, Barleria montana and Rotula aquatica	Methanol extract	Soxhlet	Streptozotocin induced diabetes model	11
Glycosmis pentaphylla, Tridax procumbens, and *Mangifera indica*	Ethanol	Soxhlet	Streptozotocin – Nicotinamide Induced diabetes model	12
Spilanthe safricana, Portulaca oleracea Linn., and *Sida rhombifolia*	Aqueous	Maceration	Streptozotocin induced diabetes model	13
Tribulus terestris, Boerhavia diffusa and *Azadirachta indica.*	Alcoholic	Maceration	Streptozotocin induced diabetes model	14
Emblica officinalis, Gymnema sylvestre, Terminalia arjuna, Tinospora cordifolia and Zingiber officinale.	Supercritical carbon dioxide	Supercritical fluid extraction (SFE) method	Streptozotocin – Nicotinamide Induced diabetes model	15
Vernonia amygdalina, Ocimum gratissimum, Allium sativum and *Zingiber officinale*	Aqueous	Continuous cold extraction	Alloxan induced diabetes model	16
Alternanthera sessilis, Amaranthus viridis, Boerhavia diffusa	Aqueous	Decoction	Alloxan induced diabetes model	17
Caesalpinia bonducella, Mucona puriens and *Pongamia pinnata*	Aqueous	Continuous hot soxhlet extraction	Alloxan induced diabetes model	18
Gymnema sylvestere, Andrographis paniculata, Momordica charantia, Pterocarpus marsupium and *Tinospora cordifolia*	Methanol	Maceration	Alloxan induced diabetes model	19
Adiantium capillus, Astercantha longifolia, Callicarpa macrophylla, Ficus benghalensis, Melia azedarach	Ethanol	Successive solvent extraction by Soxhlet apparatus	Alloxan induced diabetes model	20
Gymnema sylvestre, Syzygium cumini, Trigonella foenum- graecum, Azadirachta indica, Momordica charantia, Curcuma Longa, Piper Nigrum, Terminalia Bellirica, Swerita Chirayita and *Paneer Pera*	Hydroalcoholic extracts	Maceration	Alloxan Induced diabetes model	21
Camellia sinensis and *Macrotyloma uniflorum*	Methanol	Maceration	Streptozotocin – Nicotinamide diabetes Induced model	22
Azadirachta indica, Andrographis paniculata and *Moringa oleifera*	Hydroalcoholic extracts	Maceration	Streptozotocin induced diabetes animal model	23
Solanum nigrum, Premna corymbosa, Holarrhena pubescens, Alstonia scholaris and *Gymnema sylvestre*	Aqueous	Maceration	Alloxan Induced diabetes model	24

Camellia sinensis, Punica granatum, Macrotyloma uniflorum, Foeniculum vulgare and *Trigonella foenum-graecum*	Ethanol	Soxhlet	Streptozotocin induced diabetes animal model	25
Gymnema sylvestre, Pterocarpus marsupium, Tinospora cordifolia and *Trigonella foenumgarecum*	Ethanol	Maceration	Streptozotocin induced diabetes model	26
Cassia auriculata, Mangifera indica, Ficus banghalensis, Cinnamomum tamala and *Trichosynthis diocia*	Aqueous	Maceration	Streptozotocin induced diabetes model	27
Syzygium cumini, Urtica dioica and *Gymnema sylvestre*	Methanol	Rotary shaking	Streptozotocin induced diabetes model	28
Azadirachta indica, Gymnema sylvestre, Momordica charantia, Syzigium cumini & *Trigonella foenum*	Aqueous	With the help of a pestle and mortar	Streptozotocin induced diabetes model	29

CONCLUSION

A systematic approach should be made to find out the efficacy of polyherbal formulation against diabetes to exploit them as herbal anti-antidiabetic agents and to use medicinal plant resources could result in the development of satisfactory medicines to treat Diabetes. This review attempts to give a scientific account of the use of valuable medicinal plants extracts with their polyherbal formulation in diabetes.

REFERENCES

1. Sinha D, Dwivedi C, Dewangan MK, Yadav R, Rao SP, Chandrakar K, Singh SS, Roy A, Anti-diabetic potential of herbal plants and Polyherbal formulation., International journal of phytotherapy research., 4(3), 2014, 28.
2. Karole S, Shrivastava S, Thomas S, Soni B, Khan S, Dubey J, Dubey SP, Khan N, Jain DK, Polyherbal Formulation Concept for Synergic Action: A Review., Journal of Drug Delivery & Therap eutics., 9(1-5), 2019, 453.
3. Frode TS, Medeiros YS, Animal models to test drugs with potential antidiabetic activity., Journal of Ethnopharmacology, 115, 2008, 173–183.
4. Azeez A, Tomy S, Abdalla FM, Suresh R, Johnson B, Antidiabetic effect of Polyherbal Formulation “Kathakakhadiradi Kashyam” in Streptozotocin induced Diabetic rats., J Young Pharm, 8(4), 2016, 496-499
5. Annapurna A, Mahalakshmi D, Krishna K, Antidiabetic activity of polyherbal formulation in normal and diabetic rats., Indian journal of experimrntal biology., 39, 2001, 500-502.
6. Kumar CH, Kumar S, Ishaq BM, Rani GU, Prakash KV, Antidiabetic Activity of A Polyherbal Preparation., Pharmacologyonline 2., 2010, 780-787.
7. Chaudhari A, Sharma S, Evaluation of Antidiabetic Activity of Polyherbal Formulation in Streptozotocin-Induced Diabetic Rats., UK Journal of Pharmaceutical and Biosciences., 4(5), 2016, 01-06.
8. Tripathi N, Kumar V, Acharya S, Anti-Diabetic Activity of a Polyherbal Formulation in Streptozotocin Induced Type 2 Diabetic Rats., Journal of Natural Remedies., 16(4), 2016.
9. Baldi A, Goyal S, Hypoglycemic Effect of Polyherbal Formulation in Alloxan Induced Diabetic Rats., Pharmacologyonline, 3, 2011, 764-773.
10. Kasireddy PB, Arunkumar S, Namratha S, Swathi B, Manguluri P, Adapa V, Evaluation of anti-diabetic efficacy of polyherbal formulations in experimentally induced hyperglycemic rats., International journal of research in pharmacy and chemistry., 6(4), 2016, 750-758.
11. Balakrishnaiah P, Satyanarayana T, Pharmaceutical and Biological Evaluations, 4(2), 2017, 111-117.
12. Petchi RR, Chockalingam V, Subramani P, Antidiabetic Activity of Polyherbal Formulation in Streptozotocin – Nicotinamide Induced Diabetic Wistar Rats., J Tradit Complement Med., 4(2), 2014, 108–117.
13. Bruno MM, AmaMoor VJ, BiapaNya CP, Nanfack P, PiemeCA, Antioxidant and Synergistic Antidiabetic Activities of a Three-Plant Preparation Used in Cameroon Folk Medicine., International Scholarly Research Notices., Volume 2017.,7.
14. Saxena N, Argal A, Evaluation of Antidiabetic Activity of a Herbal Formulation., Ec Pharmacology And Toxicology, 6(5), 2018, 349-355.
15. Belhekar S, Chaudhari PD, Pandhare RB, Pawar AR, Effect of Polyherbal and Allopolyherbal Formulation on Streptozotocin-Nicotinamide Induced Diabetic Nephropathy in Rats., International Journal of Toxicological and Pharmacological Research, 8(3), 2016, 138-145.
16. Isitua CC, Akinyemi AJ, Akharaiyi FC, Olubiyi OO, Anadozie SO, Olayide II, Antihyperglycemic and Anti-hyperlipidemic Effect of Herbamed, A Herbal Formulation in Alloxan-Induced Diabetic Rats., Interventions Obes Diabetes., 1(4), 2005, 1-5.
17. Shobana, G, Devi AG, Keerthana K, John NA, Jothi G, Hariharan G, Antidiabetic potential of poly herbal formulation on alloxan induced diabetic rats. Int. Res. J. Pharm., 9(8), 2018, 90-94.
18. Selvam P, Evaluation of antidiabetic activity of a polyherbal formulation in alloxan induced diabetic rats., IJPSR, 1(9), 2010, 82-87.
19. Bhikshapathi DVRN, Rajesham VV, Pharmacological Screening of Anti Diabetic Activity of Polyherbal Formulation

In Wistar Albino Rats. American Journal of PharmTech Research, 8(3), 2018, 82-93.

20. Appalaraju G, Reddy S, Reddy V, Rajani G, Nithin, Raju AB, Anti diabetic activity of polyherbal extract on Streptozotocin induced diabetes in Wistar rats., Scholars Research Library Annals of Biological Research, 5(6), 2014, 39-46.

21. Sharma N, Goyal A, Hypoglycemic Effect of Polyherbal Formulation in Alloxan Induced Diabetic Rats., Chemistry Research Journal, 2(4), 2017, 214-219.

22. Dhanalaxmi MR, Reddy B, Antidiabetic Activity of Polyherbal Formulation in Streptozotocin – Nicotinamide Induced Diabetic Wistar Rats., World Journal of Pharmaceutical Sciences., 3(4), 2015, 743-748.

23. Mahendra KS, Development and Evaluation of Antidiabetic Potential of Polyherbal Formulation in Streptozotocin Induced Animal Model., Int J cell Sci & mol boil., 5(2), 2018, 001-008.

24. Thamizh SN, Hima KM, Sanjayakumar YR, Ranjini KR, Vasantha Kumar KG, Swamy GK, Hypoglycaemic and Antioxidant Activity of SPHAG - a Poly Herbal Formulation in Alloxan Induced Wistar Albino Rats., International Journal of Pharma Sciences and Research., 6(4), 2015, 767-772.

25. Gengiah K, Hari R, Anbu J, Antidiabetic antihyperlipidemic and hepato-protective effect of Gluconorm-5: A polyherbal formulation in steptozotocin induced hyperglycemic rats. Ancient Sci Life, 34, 2014, 23-32.

26. Yadav AP, Kori ML, Sagar R, Antidiabetic Activity of Polyherbal Formulation in Streptozotocin Induced Type II Diabetic Rats. Int. J. Pharm. Life Sci., 7(12), 2018, 5348-5353.

27. Majumder P, Paridhavi M, A Novel PolyHerbal Formulation Hastens Diabetic Wound Healing with Potent Antioxidant Potential: A Comprehensive Pharmacological Investigation. Nat Prod Chem Res, 6, 2018, 324.

28. Gyawali R, Acharya G, Pokharel M, Shah AB, Silwal A, Evaluation of Antidiabetic Polyherbal Formulations., ARJMCS, Oct, 1(1), 2015, 33-37.

29. Petchi, RR, Vijaya C, Parasuraman S, Antidiabetic activity of polyherbal formulation in streptozotocin - nicotinamide induced diabetic wistar rats., J Tradit Complement Med., 4(2), 2014 Apr, 108-17.

Source of Support: Nil, **Conflict of Interest:** None.