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CASE REPORT

Management of Hypertension Using Intensive Therapeutic Lifestyle Changes and Behavioural Modifications: A Case Report

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Summary

Lifestyle-related factors such as diet, physical activity, stress management, and sleep, among others, are very important in preventing and treating hypertension. These factors have been recognized by the World Health Organization, the Joint National Committee, and other bodies as the first line, with or without medications, in managing hypertension. Although these factors are well known to both patients and medical personnel, this knowledge has not fully translated into the practice of healthy lifestyle choices. Therefore, there is a need for behavioural interventions like motivational interviewing (MI), cognitive behavioural therapy (CBT), and positive psychology (PP) to help an individual effect and sustain a lifestyle change. This case describes a 35-year-old man with hypertension, overweight, truncal obesity, and chronic stress. He was commenced on lifestyle interventions, which included MI, CBT, and PP, to get him to the action phase in the Trans-Theoretical Stage of Change (TTSC). These changes spanned his diet and nutrition, sleep, and physical activity profiles. He was also commenced on S-amlodipine 5mg dose. After seven weeks of intervention, he was taken off the antihypertensive following low blood pressure readings. He also lost 8 kg of weight after 12 weeks with a reduced abdominal circumference. It is concluded that reversal of hypertension is achievable with Intensive Lifestyle Modification. Behavioural interventions like MI, CBT, and PP are essential for developing and sustaining lifestyle modifications.

Keywords: Cognitive Behavioural Therapy, Hypertension, Lifestyle Modifications, Motivation Interview, Positive Psychology, Lifestyle Medicine, Reversal.

Introduction

Hypertension is the foremost preventable risk factor for cardiovascular disease (CVD) and all-cause mortality worldwide. [1] Approximately 31.1% of the global adults (30-79years) population (1.28 billion people) have hypertension, defined as a systolic Blood Pressure (BP) ≥140 mmHg and/or diastolic BP ≥90 mmHg.[1,2] Globally, the prevalence of hypertension is rising due to an increased ageing population and unhealthy lifestyle-related factors.[1,2] These changes in hypertension prevalence are not uniform worldwide, with a greater incidence and impact of hypertension in Low-Middle-Income countries (LMICs) compared to high-income countries (HICs). [1,2] The African region of the World Health Organization (WHO) has the highest hypertension prevalence, 27%.[1] Nigeria has experienced an increased burden of hypertension over the years with an increased estimated age-adjusted prevalence rise from 8.5% to 32.5%between 1995 and 2020. [2] The estimated prevalence of hypertension in Nigeria from meta-analysis of cross-sectional population and/or community-based studies is 28.9% (30.6% in urban and 26.4% among rural dwellers).[2]

In the management of hypertension, lifestyle modification is the first point of care, either singly or with additional medications, depending on the stage of hypertension.[1,3] Lifestyle Medicine (LM) is an evolving field that focuses on the role of lifestyle factors in preventing, managing, and sometimes reversing chronic disease.[4] In the field's evolution, there is a strong evidence that the six pillars of LM namely a whole-food, plant-predominant eating pattern, physical activity, restorative sleep, stress management, avoidance of risky substances like alcohol and tobacco, and positive social connections—are central in the creation and maintenance of health and well-being. [4] Previous publications, including randomized controlled trials and meta-analyses, have solidified the evidence base for using these pillars within the field.[4]

Although it is known that a healthy lifestyle change can help manage hypertension, this knowledge does not automatically translate into action and adherence for the patient. [4,5] According to the health belief model, an individual's perceptions of susceptibility, severity, benefits, and barriers influence adherence.[6] Cues to action, which are events or stimuli that prompt the adoption of a health behaviour or preventive measure, are also important.[6] The Transtheoretical Stage of Change (TTSC) posits that individuals undergo stages of change when adopting healthy behaviour. [7,8] These changes range from not being interested in the change process to a desired change becoming a life-long habit. [7,8] The TTSC assesses an individual's readiness for a specific change process. [7,8] The stages of change are as follows: [7,8]

Precontemplation: There is no awareness or interest in the need to change the problem behaviour.

Contemplation: The patient will consider changing in the next six months.

Preparation: The patient is aware of the need to make a health behaviour change and prepare to do so within a month.

Action: The patient has started making specific changes, but not for up to six months.

Maintenance: Action on a specific health change has been ongoing for over six months.

It is vital to access these stages to provide a stage-matched intervention to bring about the desired lifestyle change, meaning that different TTSCs require different specific interventions.

Motivation interview (MI), Cognitive Behavioural Therapy (CBT) and Positive Psychology (PP) are the behavioural interventions used depending on the stage of change. [7,8]

Motivational Interviewing (MI) is a patient-centred counselling technique to elicit

behavioural change by helping individuals explore and resolve ambivalence. [9] This intervention is most useful for change's pre-contemplation and contemplation stages.[9] On the other hand, cognitive behavioural therapy (CBT) focuses on identifying and modifying negative thought patterns and behaviours to restructure such thought patterns.[10] It is most helpful in contemplating change, taking action, and maintaining stages. [10] Positive psychology sinterventions focus on positive emotions, strengths, virtues, and behaviours. [11] There will be challenging times in the journey of a healthy lifestyle change; hence, learning to engage the positive emotions, strengths, and virtue rather than the negative emotions and weaknesses is essential.[11] This intervention is useful for all the stages of change.[11]

This case explored the use of these lifestyle and behavioural interventions for the reversal of hypertension.

Case Description

A 35-year-old medical doctor presented on account of elevated blood pressure readings ranging from 150-168 systolic and 82-98 diastolic, done on several screenings at home a week before presentation. There was a history of a frontal headache, which felt like a tight band around his head, which was alluded to stress. There was no blurring of vision, chest pain, breathlessness at rest or exertion, palpitation, facial or leg swelling, paraesthesia, numbness, or differential limb weakness. He had a three-year history of recurring elevated blood pressure readings, with the highest readings less than 150mmHg systolic and 90mmHg diastolic. His blood pressure usually normalized after sleeping and relaxation but remained high one week before the presentation. There was no history of alcohol intake, tobacco use in any form, or psychoactive substance use. He had a family history of hypertension in first and diabetes in second-degree relations.

His Body Mass Index (BMI) was 27.8kg/m^2 with a waist circumference of 108cm and a waist-hip ratio 0.96. His pulse rate was 86b/min, normal volume and regular, with no locomotor brachialis. His BP was 168/100mmHg on the left arm and 170/94mmHg on the right arm. The fundoscopy done was essentially normal, with no detectable arterial narrowing. Other systems showed no abnormalities. Therefore, the following clinical assessments were made: Stage 2 Hypertension (ACC/AHA) to exclude secondary hypertension, chronic stress and overweight with truncal obesity.

The eGFR was 94.01ml/min/1.73m^2. His 10-year atherosclerotic cardiovascular disease (ASCVD) risk using the Framingham risk score was 4% which predicted a low risk for ASCVD over the next 10 years from the time assessed.

Treatment: He was counselled on lifestyle changes and commenced on oral s-Amlodipine 5mg daily. Motivational interviewing, cognitive behavioural therapy, and positive psychology boosted his inner motivation and self-efficiency. This was evidenced by improvement in his Trans Theoretical Stage of Change (TTSC) to action phase in all areas of concern.

Lifestyle Medicine Management

Nutrition

Assessment: At presentation, a 3-day food diary (two weekdays and a weekend) was requested. His food preferences and allergies were also assessed. The problems identified were increased refined carbohydrates (fizzy drinks, pastries), meal skipping, increased animal protein, heavy late-night meals, and snacking.

TTSC- Contemplation

Interventions: Motivational interviewing skills, CBT, and positive psychology were used. He was

encouraged to evaluate the benefits of change as well as perceived barriers to change.
Outcome: Improvement in his TTSC preparation, after which a written action plan was drawn with a confidence level of at least seven.

Movement
Using the WHO recommendations for physical activity, [2] his physical activity was inadequate. Although he worked standing most of the time, he did not intentionally engage in movements that would increase his heart rate or strengthen his muscles.
TTSC - Contemplation
Interventions: Using motivational interviewing skills, CBT, and positive psychology.
Outcome: TTSC improved in the preparation and action phases, with at least a confidence level of 7. He started engaging in brisk walking in the morning. He started with 15-30 minutes but later increased to 45-60 minutes.

Resilience (Stress, Sleep)
Assessment: He was under chronic stress as he juggled about four jobs at the same time. He used his spare time to work other jobs. He described himself as a night crawler who slept a few hours at night to attend to emails and other forms of messages and study, among other things. He had as little as 3-4 hours of night-time sleep only. He sleeps in the afternoon occasionally. He tried to catch up on Saturday sleep by sleeping 6-7 hours and taking afternoon naps.
TTSC- Contemplation
Interventions: The use of motivational interviewing, cognitive behaviour therapy (CBT), and positive psychology.
Outcome: His TTSC in this domain improved to the action stage. He was able to identify the stressors in his life, which were mainly his work demands. He addressed this by learning to decline some demands and delegate duties. He gradually adjusted to a minimum of seven hours of night-time sleep.

Social support/Connectedness
He was an introvert married in a monogamous setting with three children. He also enjoyed a close relationship with his siblings and parents. He enjoyed music and was a member of musical groups.

Four-Week Follow-Up
His TTSC was in the action phase in all the areas of concern, and his confidence level was at least seven in all areas.

Diet - His diet changed to a predominantly whole and sometimes minimally processed plant-based diet recommended by the American College of Lifestyle Medicine (ACLM).[12] This diet was low in saturated fatty acids and trans-fat, low in sodium but high in potassium, calcium, magnesium, fibre, and protein, as the Dietary Approach to Stopping Hypertension (DASH) recommended.[13] He began to eat the right quality and quantity of food at the right time. To increase the accessibility and availability of vegetables, he and his wife cultivated a vegetable garden in front of their house.

Exercise - He started engaging in moderate-intensity exercises in the morning with the support of his wife. He started with 15-30 minutes but later increased to 45-60 minutes at least five times per week. This is in keeping with the WHO recommendation for adults 18-65 years.[14]

Stress Management—He was able to identify the stressors in his life, which were mainly work demands. He learned to delegate as appropriate and decline some demands.

Sleep - He adjusted his schedule to ensure he had a minimum of seven hours of night-time sleep as recommended by ACLM.[15] His wife ensured the lights were off at bedtime.

Three-Month Follow-Up

He had lost 8kg, and his weight loss was most significant regarding his abdominal girth reduction and waist-hip ratio. His vital signs were: pulse 79 beats/minute; blood pressure of 118/74mmHg; BMI - 24.9kg/m^2; abdominal girth – 96cm and waist-hip ratio - 0.87. He stopped having headaches, and he slept better at night. His hypertension was reversed, evidenced by his having low blood pressure readings with medication use after seven weeks of lifestyle modification. This led to an eventual withdrawal of his antihypertensive medications.

Discussion

Lifestyle-related factors have been linked to the development of hypertension, especially in the areas of diet, lack of physical activities, poor sleep, and stress [16,17], as evidenced in the index patient. The WHO has identified lifestyle change as the first step in managing hypertension, with or without medications.[18] Although he knew about the role of a healthy lifestyle in the management of chronic diseases, the index patient did not adhere to a healthy lifestyle. This was similar to a study conducted among Kenyan medical students, which showed that knowledge of a healthy lifestyle (diet, physical activity, avoidance of harmful substances like tobacco and alcohol, stress management, and social connectedness) did not translate into practice.[5]

The index case was at the contemplation stage for most of the lifestyle factors before lifestyle intervention was introduced in his management. [7,8] His internal motivation, beliefs about his behavioural risk and benefit, self-efficacy, and environmental influences played out in the stage of change he was in before intervention. [19] The Social Determinants of Health (SDH) are conditions in which people are born, grow, live, work, and age. [13] These factors influence health behaviour [20], as in the index case where factors such as his occupation, working conditions, and income led to chronic stress and poor lifestyle choices: being a medical doctor, working several jobs at a time to make ends meet impacted negatively on his health and well-being.

The diagnosis of primary hypertension at his age (35 years) was a wake-up call for him in keeping with the health belief model (HBM).[6] The HBM posits that cues to action, which in this case was a formal diagnosis of hypertension at a young age, can cause a health behaviour change. Other constructs like perceived susceptibility to and perceived severity of the condition, perceived benefits of the new behaviour, perceived barriers to taking on new behaviour, and confidence in the ability to succeed at the new behaviour can affect a health behaviour change. [6] These were leveraged to motivate him for behaviour change. In addition, reflections, in other words, creating connections, tapping into emotions, and bringing awareness to what he said during the motivational interview, [21] was very helpful. With motivational interviewing skills, cognitive behaviour therapy, and positive psychology, his TTSC improved, and so did his confidence level in sustaining a healthy lifestyle change.

In a global context, research has shown promising results regarding the effectiveness of MI in improving lifestyle choices among hypertensive patients.[9] Burke *et al.* showed that MI interventions significantly increased physical activity levels and improved dietary habits among hypertensive individuals in the study. [9] In Africa, the application of MI in promoting healthy lifestyle choices among hypertensive patients has been investigated.[22] In a study by Ogedegbe *et al.*, MI was effective in enhancing medication adherence and encouraging dietary modifications among hypertensive patients in Nigeria.[22]

The efficacy of CBT in improving lifestyle behaviours among hypertensive individuals has

been studied across countries.[10] Anderson *et al.*, in a meta-analysis, concluded that CBT interventions led to significant improvements in blood pressure control and adherence to medication regimens. Although this case study focused on behavioural change and not medication adherence, it may be extrapolated that the same applies. In Nigeria, research on the application of CBT in hypertensive patients is emerging. [23] A study by Akinlua *et al.* found that CBT-based interventions improved self-management behaviours and reduced stress levels among hypertensive individuals, [23] as shown in the index patient.

There will be downtime in the journey of a healthy lifestyle change; hence, learning to engage the positive emotions, strengths, and virtue rather than the negative emotions and weaknesses is essential.[20] The same strategies were used alongside MI and CBT in the index patient. Few studies have specifically examined the effects of positive psychology interventions on lifestyle choices in hypertensive patients globally. [11] Emerging evidence suggests potential benefits.[11] For example, a study by Huffman *et al.* demonstrated that positive psychology interventions led to improvements in physical activity levels and psychological well-being among individuals with cardiovascular risk factors, of which hypertension is one.[11]

Conclusion

Motivational interviewing, cognitive-behavioural therapy, and positive psychology are promising interventions to promote healthy lifestyle choices among hypertensive patients. Further research is needed to explore their effectiveness in diverse contexts and to identify strategies for successful implementation in diverse clinical settings.

Declaration: The patient voluntarily gave his consent for the use of his data in this research.

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Reference

1. World Health Organization. Hypertension, 2021. Available https://www.who.int/news-room/fact-sheets/detail/hypertension#:~:text=For%20most%20people%2C%20the%20goal,vessels%20and%20prevent%20kidney%20damage. Accessed October 2024.
2. Adeloye D, Owolabi EO, Ojji D, Auta A, Dewan MT, Olanrewaju TO, et al. Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: a systematic analysis of current evidence. J Clin Hypertens 2021;23:963-977.
3. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertens 2020;75:1334-1357.
4. Lippman D, Stump M, Veazey E, Guimarães ST, Rosenfeld R, Kelly JH, et al. Foundations of Lifestyle Medicine and its Evolution, Mayo Clinic Proceedings: Innovations, Quality and Outcomes 2024;8:97-111.
5. Kigaru DMD, Kamau JW, Omuse G, Njuguna N, Muttai H. Knowledge of lifestyle practices does not translate into practice: a cross-sectional study on lifestyle practices among medical students in Kenya. Pan Afr Med J 2018;29:120.
6. Hayden J. Introduction to Health Behaviour Theory. 3rd Ed. Jones & Bartlett Learning. 2019.

7. Prochaska J, Norcross J. DiClemente C. Changing for good: A Revolutionary Six Stage Program for Overcoming Bad Habits and Moving Your Life Positively Forward. Harper Collins. 2010.
8. Prochaska JO, Velicer WF. The transtheoretical model of health behaviour change. Am J Health Promot. 1997;12:38-48.
9. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. Journal Consulting Clin Psychol 2013;71:843–861.
10. Guthrie G. 82. Definition of lifestyle medicine. In: Lifestyle Medicine. 3rd Ed. CRC Press. 2019.
11. Huffman JC, Legler SR, Boehm JK. Positive psychology well-being and health in patients with heart disease: a brief review. Future Cardiol 2017;5:443-450.
12. American College of Lifestyle Medicine. Diet and Nutrition. Available at: https://www.lifestylemedicine.org/ACLM/Lifestyle_Medicine/Diet_and_Nutrition/ACLM/Diet_and_Nutrition/Diet_and_Nutrition.aspx?hkey=5e4bcd0d-c47b-4843-b19e-1578154ff705. Accessed 06 August 2023.
13. Appel L.J, Moore TJ, Obarzanek E, Vollmer WM, Svetkey LP, Sacks FM, et al. A clinical trial of the effects of dietary patterns on blood pressure. New Engl J Med 1997;336:1117-1124.
14. World Health Organization. Global recommendations on physical activity for health. 2020. Available https://apps.who.int/iis/handle/10665/44399. Accessed 11 August,2023
15. American College of Lifestyle Medicine. Sleep. Available at: https://www.lifestylemedicine.org/ACLM/Lifestyle_Medicine/Sleep/ACLM/Sleep/Sleep.aspx?hkey=b9808e02-3984-4ad6-acc5-8d5a9395ebde. Accessed 6/8/2023.
16. Appel LJ. Lifestyle modification as a means to prevent and treat high blood pressure. J Am Soc Nephrol 2003; 14:S99-S102.
17. Appel LJ, Champagne CM, Harsha DW, Cooper LS, Obarzanek E, Elmer PJ, *et al.* Effects of comprehensive lifestyle modification on blood pressure control: main results of the PREMIER clinical trial. JAMA 2003;289:2083-2093.
18. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines. Hypertens 2020;75:1334-1357.
19. LaMorte WW. Behaviour Change Models Introduction and Learning Objectives. Sphweb.bumc.bu.edu. 2019. https://sphweb.bumc.bu.edu/otit/MPHModules/SB/BehaviouralChangeTheories/index.html. Accessed August 2023.
20. NEJM Catalyst. Social Determinants of Health (SDOH). Massachusetts Medical Society. Catalyst.nejm.org 2017. https://catalyst.nejm.org/doi/full/10.1056/CAT/17.0312. Updated 01 December, 2017. Accessed: August, 2023.
21. Schrantz KN, McLean ALL. Reflection (Therapeutic Behaviour). In: Zeigler-Hill V, Shackelford TK (Eds) Encyclopedia of Personality and Individual Differences. Springer, Cham. https://doi.org/10.1007/978-3-319-24612-3_841
22. Ogedegbe G, Chaplin W, Schoenthaler A, Statman D, Berger D, Richardson T, Phillips E. A practice-based trial of motivational interviewing and adherence in hypertensive African Americans. Am J Hypertens 2012;21:1137–1143.
23. Anderson RJ, Freedland KE. Cognitive-behavioural therapy for depression in patients with hypertension: A systematic review and meta-analysis. Psychosomatic Med 2016;68:595–602.