



EFFECT OF INTEGRATIVE NATUROPATHY AND YOGA INTERVENTION ON LIPID PROFILE

A. Jai Ganesh (BNYS)*, Shashikiran H C (BNYS, MD) and Prashanth Shetty (BNYS, MSc, PhD)

India.

*Corresponding Author: A. Jai Ganesh (BNYS)

India.

Article Received on 26/09/2019

Article Revised on 17/10/2019

Article Accepted on 07/11/2019

ABSTRACT

Background and objectives: Dyslipidaemia is a metabolic abnormality leading to persistent increase in the plasmatic concentration of cholesterol and triglycerides. It may be dyslipidaemia, hypercholesterolemia, hypertriglyceridemia. The combined effect of Naturopathy and Yoga was less understood on serum lipid profile. Hence, this study was conducted to evaluate the effects of naturopathy and yoga on lipid profile. **Materials and methods:** 100 patients of both male and female genders were entitled for the study who fulfilled the inclusion criteria were appraised for the purpose of the study. They were recruited from SDM Yoga and Nature cure hospital. They underwent yoga and naturopathy-based treatments. Assessments were made on the day of admission and discharge. The assessment tools used are lipid profile. **Results:** After the integrated approach of yoga and naturopathy intervention, there was highly significant changes in lipid profile- HDL was elevated while total cholesterol, triglycerides and LDL decreased. **Conclusion:** The study result suggest that naturopathy and yoga can be helpful in patients with lipid metabolism disorders such as coronary artery disease, diabetes mellitus and dyslipidemia etc.

KEYWORDS: Cholesterol, triglycerides, lipoproteins, lipid profile, naturopathy and yoga.

INTRODUCTION

Dyslipidaemia is a common cause of morbidity all over the world, and the most common form is hypercholesterolemia defined as an increased cholesterol level above 190mg/dl.^[1] Dyslipidaemia is the one of the modifiable risk factor in CHD.^[2] It initiates atherosclerotic plaque formation, finally resulting in degeneration of endothelial cell function, which enhances the coagulability of blood by activation of various factors for which apolipoproteins have been implicated. Hypercholesterolemia, combined hyperlipidemia and hypertriglyceridemia are three important factors for CHD.^[3] Recently, the National Cholesterol Education Panel (NCEP) has officially described and identified a number of these risk factors for cardiovascular diseases.^[4] These include: abdominal obesity, elevated TG levels, low high-density lipoprotein (HDL)-cholesterol levels, increased blood pressure, and impaired fasting glucose.^[5] Among the different risk factors for CHD, a raised LDL level appears to be primary. Strong evidence indicates that high LDL concentrations initiate atherogenesis and promote atherosclerosis at every stage. The remarkable finding that LDL-lowering therapy reduces risk for subsequent coronary events even in patients with advanced atherosclerotic disease discloses a role for LDL in late stages of atherogenesis.^[6,7,8] The modification of lipid

profile may be important in both prevention and control of CHD.^[9] Moreover, populations devoid of some elevations of LDL levels exhibit relatively low prevalence of CHD even when other coronary risk factors, eg, cigarette smoking, hypertension, and diabetes mellitus, are common.^[10] An elevated LDL thus is at the core of atherogenesis. Table 1 classifies LDL-cholesterol levels according to NCEP guidelines; approximate corresponding values for total cholesterol also are listed. In the United States, most CHD occurs in patients who have borderline high-risk or high-risk LDL levels; CHD rarely develops when LDL-cholesterol levels are optimal (ie, <100 mg/dL).^[11] An increased number of small, dense LDL particles is a constant feature of the dyslipidemia of abdominal adiposity, as they are associated with insulin resistance, intraabdominal fat, and hypertension.^[12,13,14]

Naturopathy is a system of man building in harmony with constructive principles of nature on physical, mental, moral and spiritual planes of living and consists of non-invasive treatments modalities like diet therapy, fasting therapy, mud therapy, hydro therapy, manipulative therapy, acupressure, acupuncture, chromo therapy, and magneto therapy.^[15] Naturopathy, also termed as a nature cure, is the science of curing the ailments with the help of nature. It is both the way of life

and concept of healing that uses various natural means of treating human infirmities and disease state.^[16,17] It is the science and art of healing which potentiates inherent healing processes thus helps to restore and maintains the highest possible degree of health.^[18]

Yoga is an ancient discipline designed to bring balance and health to the physical, mental, emotional, and spiritual dimensions of the individual. Yoga is often depicted metaphorically as a tree and comprises eight aspects, or “limbs:” yama (universal ethics), niyama (individual ethics), asana (physical postures), pranayama (breath control), pratyahara (control of the senses), dharana (concentration), dyana (meditation), and samadhi (bliss).^[19] Yoga is a holistic system of multiple mind body practices for mental and physical health that include physical postures and exercises, breathing techniques, deep relaxation practices, cultivation of awareness/mindfulness, and meditation. Yoga and

meditation techniques have been shown to reduce perceived stress^[20,21] and improve mood.^[22] Yoga improves symptoms associated with a number of chronic health conditions including metabolic syndrome.^[23]

METHODOLOGY

Subjects: A total of 100 subjects with an age between 20-65 years were recruited for the study. Subjects who fulfilled inclusion criteria were apprised about the purpose of study and their rights as a research subject. The subjects were recruited from SDM Yoga and nature cure hospital-Sowkyavana pareeka, Dakshina Kannada, Karnataka.

Criteria for diagnosis: The American Association of Clinical Endocrinologist (AACE) Medical Guidelines for Clinical Practice for the Diagnosis and Treatment of Dyslipidemia and Prevention of Atherogenesis 2002 Amended Version will be applied as diagnostic criteria.

Borderline and Higher Risk Serum Lipid Concentration.^[24]

Lipid	Borderline serum concentration (mg/dl)	High risk serum concentration (mg/dl)
Cholesterol	200-239	≥ 240
HDL-C	35-45	< 35
LDL-C	130-159	≥ 160
Triglycerides	150-200	> 200

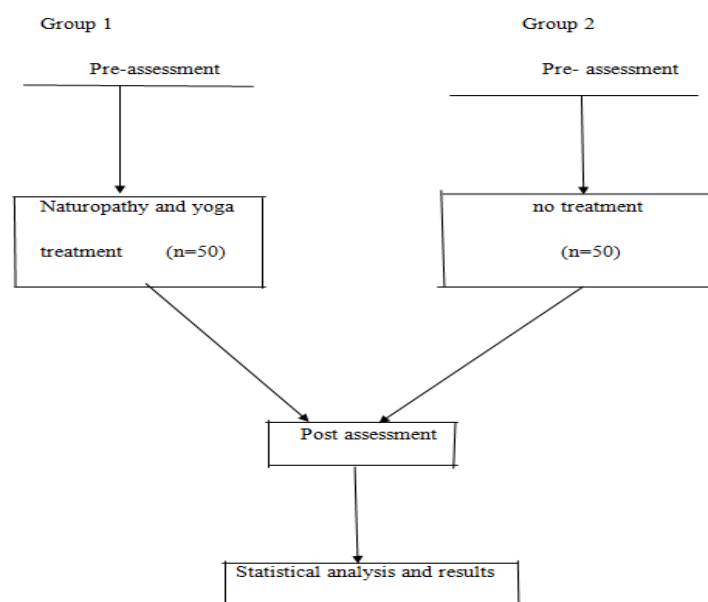
The previous history of practicing yoga for a year, recent surgery, any underlying pathological conditions, psychologically ill and pregnant and lactating women are excluded.

Ethical Considerations: Signed informed consent will be obtained from the participants before the commencement of the study in the study after explanations of protocol of the study. The approval from the Institutional Ethics Committee will be taken

Grouping: total 100 subjects are divided into two groups
Group 1- n= 50
Group 2 -n=50

Method: The study subjects were identified and screened as per the demands of the inclusion and exclusion criteria. Pre-assessment prior to the intervention and post assessments were done after completing the 10 days of intervention using the variables.

Illustration of the study



Intervention: For patients Naturopathy and Yoga intervention were given. It includes yoga, hydrotherapy, diet therapy, mud therapy and manipulative therapy. The following integrated yoga and naturopathy protocol will be used for all the subjects for ten days duration. The patient will be prescribed Naturopathy based diet.

Yogic interventions: The restorative yoga intervention was created by an expert yoga panel employing Iyengar poses^[25] and Iyengar influenced poses.^[26] Includes asanas (standing, supine, prone and sitting series), pranayama, kriyas (jala neti, sutra neti, vaman dhouti) and relaxation techniques.

Diet Protocol

Day	7:30am	9:00 am	11:00 am	2:00pm	4:00pm	6:30pm
1	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
2	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot jue	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
3	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
4	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
5	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
6	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
7	Ash-gourd Juice	Ragi ganji	Milletts, papaya, buttermilk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
8	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
9	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk
10	Ash gourd juice	Ragi ganji	Milletts, papaya, butter milk	Carrot juice	Cucumber	Chapathi, Boiled vegetables, apple, buttermilk

Treatment Protocol

Day	7:30	8:00am	2:00 pm	2:30 pm
1	Eye and abdomen pack	Steam bath	Eye and abdomen pack	Cold hip bath
2	Eye and abdomen pack	Sauna bath	Eye and abdomen pack	Cold immersion bath
3	Eye and abdomen pack	Cold circular jet	Eye and abdomen pack	Cold spinal spray
4	Eye and abdomen pack	Full body massage	Eye and abdomen pack	Cold spinal bath
5	Eye and abdomen pack	Full mud bath	Eye and abdomen pack	Hot arm and foot bath
6	Eye and abdomen pack	Abdomen massage	Eye and abdomen pack	Cold hip bath
7	Eye and abdomen pack	Colon hydrotherapy	Eye and abdomen pack	Cold immersion bath
8	Eye and abdomen pack	Deluxe hydro massage	Eye and abdomen pack	Cold spinal spray
9	Eye and abdomen pack	Cold underwater massage	Eye and abdomen pack	Cold spinal bath
10	EP,AP	SG massage	EP ,AP	Hot arm and foot bath

RESULTS

Paired Samples Test on Experimental Group

Paired Samples Test on Experimental Group									
		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	TC_Pre - TC_Post	68.440	38.358	5.425	57.539	79.341	12.616	49	.000
Pair 2	TG_Pre - TG_Post	87.300	62.641	8.859	69.498	105.102	9.855	49	.000
Pair 3	HDL_Pre - HDL_Post	-3.180	2.826	.400	-3.983	-2.377	-7.956	49	.000
Pair 4	LDL_Pre - LDL_Post	39.020	33.053	4.674	29.626	48.414	8.348	49	.000
Pair 5	VLDL_Pre - VLDL_Post	8.860	7.944	1.123	6.602	11.118	7.887	49	.000

From the above table 1, we observe that the pre and post-measurement of the all variables are under consideration are significant at the 5 percent level of significance as

p.value is less than 0.05. It can be concluded that treatment is effective.

Paired Samples Test on control group.

Paired Samples Test on control group:									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	TC_Pre1 - TC_Post1	3.460	6.351	.898	1.655	5.265	3.852	49	.000
Pair 2	TG_Pre1 - TG_Post1	3.400	8.332	1.178	1.032	5.768	2.885	49	.006
Pair 3	HDL_Pre1 - HDL_Post1	.120	2.309	.327	-.536	.776	.367	49	.715
Pair 4	LDL_Pre1 - LDL_Post1	-.120	5.114	.723	-1.573	1.333	-.166	49	.869
Pair 5	VLDL_Pre1 - VLDL_Post1	1.300	1.418	.201	.897	1.703	6.483	49	.000

From the above table 1, we observe that the pre and post-measurement of the all variables are under consideration are significant at the 5 percent level of significance as P value is less than 0.05. It can be concluded that treatment is effective.

DISCUSSION

The main aim of the study was to evaluate the influence of Yoga and naturopathy treatments on Serum lipid profile. This is a randomized control study with the sample of 100 subjects. Dyslipidemias, which include lipoprotein overproduction or deficiencies, are primary disorders of lipoprotein metabolism or secondary disorders induced by behavioral or other metabolic causes. Disorders of lipoprotein metabolism are collectively referred as dyslipidemia. The majority of patients with dyslipidemia have some combinations of genetic predisposition and environmental contributions such as diet, life style, medical condition or drugs.^[27]

Present study shows significant difference in reducing the total cholesterol, triglycerides, LDL cholesterol, VLDL cholesterol and increase in HDL cholesterol levels. We observe that the pre and post-measurement of the all variables under consideration are significant at the 5 percent level of significance as P value is less than 0.05.

There are many therapies that can correct the variations in serum lipid profile and cure dyslipidemia and prevent the further complications, naturopathy and yoga is one of them. They are considered to be a drugless system of cure and without side effects. They include hydrotherapy, diet therapy, and yoga practice and so on.^[28] It is better to treat any acute or chronic pathological condition by these therapies. Naturopathy and Yoga does not only concentrate on removing the etiology but also cure the individual as a complete.

Naturopathic diet plays a very important role in regulating the proper metabolism and serum lipid profile. The addition of water-soluble (viscous) fibers and plant stanols/sterols (usually found in margarines) is encouraged if lipids are not normalized by a reduction of saturated fat and cholesterol. Because omega-3 fat found in fish lowers TG levels and is associated with a lower risk for CHD. A Mediterranean-type diet (30–40% of calories as total fat, an emphasis on monounsaturated fat, and saturated fat limited to 7% of calories) can reduce LDL-C without decreasing HDL-C and increasing TG, but the higher fat intake may make calorie control and weight loss more difficult. Diet recommendations for dyslipidemia should be individualized based on the patient's lipid pattern, body weight, food preferences, and level of motivation. Increased consumption of foods high in soluble (viscous) fiber may be beneficial for some patients with LDL-C elevations. The primary sources of water-soluble fiber are oats, barley, legumes (dried beans and peas), fruits, and some vegetables. Including 20 to 30 g of dietary fiber per day, of which 10 to 25 g is soluble, could result in an additional 5% to 15% reduction in TChol and LDL-C.^[29] Patients who do not experience increased TG with higher carbohydrate intakes achieve the best results on a diet containing 20% of calories as fat. Alcohol should not be recommended as a treatment for low HDL-C. Because HDL-C levels are reduced in patients who are overweight or who have the metabolic syndrome, the normalization of body weight through calorie restriction and increased exercise is the primary goal for patients with low HDL-C. HDL-C levels may also increase in response to a diet higher in monounsaturated fats (nuts, avocado, canola, or olive oil) or the omega-3 polyunsaturated fats found in fish. If fat intake is increased, the quantity of carbohydrate foods will need to be decreased in order to maintain a consistent calorie intake and prevent weight gain. Adequate intake of folic acid (400 mcg/day) can help prevent elevations of serum homocysteine, which increases the risk of CHD and stroke.^[30]

Physical activity is associated with improvement in the lipoprotein profile, but results depend on baseline lifestyle habits, presence of obesity or diabetes, type of dyslipidemia, and the specific exercise program. Both endurance and resistance exercise are helpful in achieving weight reduction and in reducing triglycerides and raising HDL-C, but have little influence on LDL-C unless there is significant weight loss. Daily physical activity increases the clearance of TG-rich lipoproteins and glucose and is often moderately effective in treating hypertriglyceridemia and combined dyslipidemia. Exercise of moderate intensity, longer duration, and increased frequency appears to have more benefit for dyslipidemia and weight loss than higher intensity, less frequent activity.^[31] The studies conducted in western countries had reported a fall in triglycerides and increase in HDL-cholesterol, after physical activity.^[32] It seems quite probable that increased physical activity leads to lowered plasma triglyceride concentrations and ultimately increased plasma HDL-cholesterol. Physical activity and HDL appear to be linked via HDL's role in triglyceride metabolism.^[33]

Use of hydrotherapy in the form of packs and compresses^[34] helps to improve and enhance the blood circulation to the abdominal visceral organs and thereby improve the metabolism and other liver functions.

The study conducted here was to evaluate the effectiveness of naturopathy and yoga intervention in serum lipid profile. As the results here have shown that the interventions given were effective as an alternate therapy to regulate the serum lipid profile and to avoid the further complications like CHD, stroke, etc.

REFERENCES

1. OMS. Cadre global mondial de suivi, comprenant des Indicators et serie de cibles mondiales volontaires pour la lute contre les maladies non transmissibles. Geneva, Switzerland: OMS, 2012.
2. Genest J Jr., Cohn JS. Clustering of cardiovascular risk factors: Targeting high-risk individuals. *Am J Cardiol*, 1995; 76: 8A-20A.
3. Stein Y. Comparison of European and USA guidelines for prevention of coronary artery disease. *Atherosclerosis*, 1994; 110: 541-4.
4. Executive Summary of The Third Report of The National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, And Treatment of High Blood Cholesterol In Adults (Adult Treatment Panel III). *Jama*, 2001; 285: 2486-2497.
5. Edwards KL, Talmud PJ, Newman B, Krauss RM, Austin MA: Lipoprotein candidate genes for multivariate factors of the insulin resistance syndrome: a sib-pair linkage analysis in women twins. *Twin Res.*, 2001; 4: 41-47.
6. Scandinavian Simvastatin Survival Study Group. Randomized trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S). *Lancet*, 1994; 344:1383-1389.
7. Shepherd J, Cobbe SM, Ford I, Isles CG, Lorimer AR, Macfarlane PW, McKillop JH, Packard CJ, for the West of Scotland Coronary Prevention Study Group. Prevention of coronary heart disease with pravastatin in men with hypercholesterolemia. *N Engl J Med.*, 1995; 333: 1301-1307.
8. Sacks FM, Pfeffer MA, Moye LA, Rouleau JL, Rutherford JD, Cole TG, Brown L, Warnica JW, Arnold JMO, Wun C-C, Davis BR, Braunwald E, for the Cholesterol and Recurrent Events Trial Investigators. The effect of pravastatin on coronary events after myocardial infarction in patients with average cholesterol levels. *N Engl J Med.*, 1996; 335: 1001-1009.
9. Manninen V, Elo MO, Frick MH, Haapa K, Heinonen OP, Heinsalmi P et al. Lipid alteration and decrease in incidence of coronary artery disease in the Helsinki Heart Study. *JAMA*, 1988; 260: 64151.
10. Grundy SM, Wilhelmsen L, Rose R, Campbell RWF, Assman G. Coronary heart disease in high-risk populations: lessons from Finland. *Eur Heart J.*, 1990; 11: 462-471.
11. Stamler J, Wentworth D, Neaton JD. Is the relationship between serum cholesterol and risk of premature death from coronary heart disease continuous and graded? Findings in 356,222 primary screenees of the Multiple Risk Factor Intervention Trial (MRFIT). *JAMA.*, 1986; 256: 2823-2828.
12. McNamara J, Campos H, Ordovas J, Peterson J, Wilson P, Schaefer E. Effect of gender, age, and lipid status on low density lipoprotein subfraction distribution. Results of the Framingham Offspring Study. *Arteriosclerosis*, 1987; 7: 483-490.
13. Swinkels D, Demacker P, Hendriks J, van't Laar A. Low density lipoprotein subfractions and relationship to other risk factors for coronary artery disease in healthy individuals. *Arteriosclerosis*, 1989; 9: 604-613.
14. Austin MA, King MC, Vranizan KM, Krauss RM. Atherogenic lipoprotein phenotype. A proposed genetic marker for coronary heart disease risk. *Circulation*, 1990; 82: 495-506.
15. Dept. of AYUSH, Ministry of health and family welfare, Govt. of India. Retrieved from: http://indianmedicine.nic.in/index3.asp?sslid=187&s_ubsublinkid=36&lang=1
16. George Cody. History of Naturopathic Medicine, In, Joseph E Pizzornojr, Michel T. Murray Text Book of Natural Medicine, 4nd Edition, Volume 1, Church Hill Livingstone, 2013; 34: 9.
17. Dr. Rajiv Rastogi. Introduction to Naturopathy, 1st Edition, Raghuvansisales Corporation, Agra, 2001; 1, 3
18. Shelton, H.M. (1923). Definition of Naturopathy. *Herald of Health and Naturopathy*, XXV111, 2016.
19. Iyengar BKS. Light on Yoga. 2nd ed. New York: Schocken Books, 1976.

20. Michalsen A, Grossman P, Acil A et al. Rapid Stress Reduction and Anxiolysis among Distressed Women as a Consequence of a ThreeMonth Intensive Yoga Program. *Medical Science Monitor*, 2005; 11: CR555-CR561.
21. Granath J, Ingvarsson S, von Thiele U, et al. Stress Management: A Randomized Study of Cognitive Behavioural Therapy and Yoga. *Cognitive Behavioural Therapy*, 2006; 35: 3–10.
22. Khalsa SB, Cope S. Effects of a Yoga Lifestyle Intervention on Performance-Related Characteristics of Musicians: A Preliminary Study. *Medical Science Monitor*, 2006; 12: CR325-CR331.
23. Innes K, Bourguignon C, Taylor A. Risk indices associated with the insulin resistance syndrome, cardiovascular disease, and possible protection with yoga: A systematic review. *Journal of the American Board of Family Practice*, 2005; 18: 491–519.
24. Jellinger PS, Dickey RA, Ganda OP, Mehta AE, NguyenTT, Rodbard HW, et al. The American Association of Clinical Endocrinologist (AACE) Medical Guidelines for Clinical Practice for the Diagnosis and Treatment of Dyslipidemia and Prevention of Atherogenesis 2002 Amended Version. *EndocrPract*, 2002; 6(2): 1-52.
25. Iyengar BKS. *Yoga: The Path to Holistic Health*. London: Dorling Kindersley, 2001.
26. Lasater JH. *Relax and Renew: Restful Yoga for Stressful Times*, Second Edition. Berkeley CA: Rodmell, 2011.
27. Harrison's Principle of internal medicine – 20th edition, chaptore number 400 disorders of lipoprotein metabolism.
28. Springer. Lifestyle factors associated with gastritis. *International Journal of Clinical Oncology*, 2003; 8(6): 362-8.
29. Jenkins DJ, Kendall CW, Vidgen E, et al. The effect on serum lipids and oxidized low-density lipoprotein of supplementing self-selected lowfat diets with soluble-fiber, soy, and vegetable protein foods. *Metab Clin Exp.*, 2000; 49: 67–72.
30. Stein JH, McBride PE. Hyperhomocysteinemia and atherosclerotic vascular disease: pathophysiology, screening and treatment. *Arch Intern Med.*, 1998; 158: 1301–6.
31. Oberman A, Kreisberg RA, Henkin Y. Principles and management of lipid disorders: a primary care approach. Baltimore: Williams & Wilkins, 1992.
32. Szapary PO, Bloedon LT and Foster GD. Physical Activity and Its Effects on Lipids. *Current Cardiology Reports*, 2003; 5: 488-92. 8
33. Thompson PD. What do muscles have to do with lipoproteins? *Circulation*, 1990; 81: 1428-30.
34. Dahlen HG, Homer CS, Cooke M, Upton AM, Nunn RA, Brodrick BS. 'Soothing the ring of fire': Australian women's and midwives' experiences of using perineal warm packs on abdomen. *Midwifery*, 2009; 25(2): e39–e48.