The Clinical Utility of a Family History Risk Assessment Tool

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A. Study Design And Rationale

The purpose of this study is to determine the clinical utility of a family history risk assessment tool currently being developed by the CDC Office of Genomics and Disease Prevention. The proposed study will determine if risk stratification based on this family history tool, can be used to target high risk populations with personalized primary prevention health information about diet, lifestyle modification, risk factor management and current screening recommendations.

Results from several long-term prospective studies have consistently identified people with low levels of risk factors as having lifelong low levels of heart disease, stroke and several other chronic conditions. More specifically, data from the Nurse's Health Study, has shown that women maintaining a desirable body weight, eating a healthy diet, exercising regularly and not smoking could account for a up to an 84% reduction in risk of cardiovascular disease but only 3% of the women studied were in this category. This suggests that people that lead "healthy lifestyles" can reduce their risk of developing major chronic diseases such as cardiovascular disease, diabetes mellitus, certain cancers and osteoporosis.

How can we better identify people at an increased risk? Our proposed study attempts to answer that question by suggesting that family history should be used along with others clinical risk factors to stratify patients into risk categories. Family history is independently and highly predictive of future disease because it represents the combined influence of genetic, environmental and behavioral risk factors on disease expression in multiple family members. For example, it is well known that a family history of premature heart disease is an independent predictor of cardiovascular disease even after adjusting for an individual's own established risk factors such as hypertension, smoking and abnormal lipids.

Despite the well-established relationship between family history and the incidence of certain chronic diseases, consistent assessment and utilization of this information in clinical practice and public health settings are sub-optimal. This is likely secondary to the lack of a valid and easily applied tool to measure and quantify risk based on a positive family history. Our proposed study will test the clinical utility of a family history risk assessment tool currently being developed by the CDC Office of Genomics and Disease Prevention.

Once patients are appropriately stratified into risk categories, can personalized health information more effectively motivate individuals to adopt healthier lifestyles. Our definition of a healthy lifestyle is based on the Healthy People 2010 Objectives related to lifestyle, which included regular exercise, no smoking status and a healthy diet. Healthy People 2010 was created by the United States Department of Health and Human Services and it is an extension of the 1979 Surgeon General's Report, Healthy People 2000: A National Health Promotion and Disease Prevention Agenda.

B. Study Design And Statistical Analysis

This will be a randomized, controlled clinical trial that follows patients for 6 months. All eligible participants will be randomized to receive either general health messages or a personalized health intervention based on their risk level as determined by the standardized family history risk assessment tool. The personalized primary prevention health interventions will include education about individual diets, lifestyle modification, risk factor management, current screening recommendations and follow-up evaluations. All participants will also have standard physiological variables and traditional risk factors measured at baseline and six months. The primary outcome will be the proportion of

participants that achieve three of the leading health indicators of the Healthy People 2010 Objectives related to lifestyle: regular exercise, no smoking status and diet.

The Passport to Heart Health Program was created to offer free cardiovascular risk factor screening for family and friends of patients admitted to the hospital for heart disease. Over the past year approximately 1165 subjects have been recruited from the Columbia Presbyterian and Cornell Weill Medical Centers and their clinical data analyzed. We have found that at baseline, approximately 20% of the participants reported meeting the combined criteria of. consuming 5 fruits and vegetables a day, regular excise for at least 30 minutes per day 3 days a week and did not smoke. We will assume our proposed study participants will have similar baseline characteristics because we will be recruiting from a similar pool of potential subjects. A literature search of studies using personalized health education for fruit and vegetable consumption resulted in changes anywhere from 5% to 75% in the intervention arm versus the controls. Given this wide range, we will design our study to detect a 10% increase in the proportion of intervention participants (30%) that achieve the primary outcome versus controls (20%). A Chi-squared test with an alpha of .05 and a power of 80% detects a 10% change when the sample size is 313 in each group. If we assume a 10% drop out rate, we should increase our sample size to 344 in each group for a total of 688. We will recruit a slightly more conservative figure of 700 total subjects.

C. Study Procedure

After the patients are randomized to one of the two groups, they will be followed clinically for six months. At baseline, all participants will be administered a self report question-naire on health status, risk factors, preventive behaviors, use of medical services, diet, activity, risk perception and stage of readiness to change behavior. Participants will also have lipids, glucose, BMI, waist circumference, blood pressure and carbon monoxide levels measured. Finally, all participants will be administered the CDC Office of Genomics and Disease Prevention family history risk assessment tool.

Those participants randomized to the control arm will not be told their family history risk score or the values of their measured risk factors. The control participants will only be provided with primary prevention information in the form of standard public health messages related to smoking cessation, physical exercise and diet. Participants randomized to the intervention arm will be stratified based on their family history risk score and will be informed of all measured risk factors. Personalized educational interventions with a prevention facilitator will be implemented based on risk level: average, moderate or high risk. The personalized primary preventive interventions will include one-on-one education about individual diets, lifestyle modification, risk factor management, current screening recommendations and follow-up evaluations. The prevention facilitator will also provide medical, nutritional and other referrals as needed. In addition, the prevention facilitator will also call all intervention arm participants at 2 weeks, 4 weeks and 3 months after baseline to reinforce prevention goals, to review progress towards designated goals, to follow-up with screening recommendations and to assess barriers to compliance.

At the 6 months visit, all subjects will repeat the baseline evaluation and will be informed of all results. Control arm patients will also be informed of their initial baseline family history risk score and all measured risk factors. All participants will also have their lipids, glucose, BMI, waist circumference, blood pressure and carbon monoxide levels measured again. At the conclusion of the study, all controls will be offered the same personalized educational interventions provided to the intervention group, tailored to risk level as determined by the family history tool (excluding follow-up phone calls).

D. Study Drugs

N/A

E. Medical Device

N/A

F. Study Questionnaires

Participants will have to complete questionnaires to assess current health status, risk factors, diet, activity, preventive behaviors, use of medical services, risk perception and stage of readiness to change behavior. In addition, a family history risk assessment tool currently being developed by the CDC Office of Genomics and Disease Prevention will be administered to all participants.

G. Study Subjects

a. Inclusion criteria

All women between the ages of 35- 85 years (inclusive) who present to the Columbia Presbyterian Medical Center for routine screening breast mammography are eligible. Potential participants must be willing and able to give informed consent, have a life expectancy for at least 5 years, be able to speak either English or Spanish, be cooperative, be willing to return to Columbia Presbyterian Medical Center for a 6-month evaluation and be willing to sign a edical release form. Permission from a physician is not necessary for participation in this study.

b. Exclusion criteria

Women will be excluded from this study if they have a primary diagnosis of cardiovascular disease, cancer, diabetes mellitus or osteoporosis. Potential participants will be excluded if they have a life expectancy of less than 5 years, a prescribed special diet that conflicts with the stated recommendations, a prescribed exercise limitation or are uncooperative and unlikely to return for follow-up visits.

H. Recruitment Of Subjects

All potential participants will be recruited from the Columbia Presbyterian Medical Center because they have undergone routine screening breast mammography. Potential participants that meet the previously defined inclusion criteria will be enrolled.

I. Confidentiality Of Subjects

Study data will be coded and stored in a secure location in accordance with IRB regulations.

J. Potential Conflict Of Interest

N/A

K. Location Of Study

Columbia Presbyterian Medical Center.

L. Potential Risks

There is minimal risk anticipated by participation in this study. There could be slight discomfort associated with the finger-stick procedure used to measure cholesterol and glucose levels.

M. Potential Benefits

Participants may or may not benefit from this study. All participants will be receiving education on ways to lower their risk of heart disease, certain cancers and osteoporosis, but this information does

not replace the advice of their primary physicians. In addition, any information gathered from this study may help to develop methods to identify women at high risk for heart disease, cancer, diabetes mellitus and osteoporosis in the future.

N. Alternative Tberapy

This is not a treatment study. The alternative is not to participate in this study.

O. Compensation To Subjects

There will be no compensation for participation in this study.

P. Costs To Subjects

We do not anticipate that participants will incur any costs by enrolling in this study. Parking validation or mass transit commuter fares will be provided for all scheduled follow up visits.

Q. Minors As Research Subjects

N/A

R. Radiation Or Radioactive Substances

N/A

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