



SOIL TRANSMITTED HELMINTHIC INFECTION IN PREGNANCY AND PREVALENCE ASSOCIATED FACTORS AMONG PREGNANT WOMEN IN RURAL VILLAGES OF DHARWAD DISTRICT.

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ABSTRACT:

Objective: The objective of the study was to investigate the prevalence of soil transmitted helminthic infection in pregnancy and associated factors among pregnant women

Research design: Cross Sectional Research Design was used to conduct the study.

Samples : 60 primigravida women were selected for the study.

Results: The findings of the study indicated that pregnant women from rural residences, those with STH infection were more prone to be anemic compared to those from urban residences,. In the current study those pregnant women who had a habit of walking bare foot had high anemia prevalence (57.8%). Hookworm infection rate was also associated with anemia in which pregnant women who were infected with hookworm had a 2.4 times higher risk of developing anemia, as 68.4% of the pregnant women infected with hookworm were anemic.

Conclusion: The severity of anemia is pronounced more when women are infected during their gestational period. The high prevalence of soil transmitted helminthic infection indicates that it is currently a serious health problem of pregnant women living in rural area. Antenatal care should promote de-worming and education on personal hygiene.

Keywords: pregnant women, Soil-transmitted helminths.

INTRODUCTION:

Soil-transmitted Helminthes (STH) infects nearly 6 to 7 lakh people of Dharwad district with a population of 1847023 with children and pregnant women being the most affected. According to the World Health Organization (WHO) estimates, global cases with 220.6 million children and 120 million pregnant women in need of preventive chemotherapy. STH infections will cause diarrhea, abdominal pain and low hemoglobin levels as the immediate outcome of infections, in pregnancy and however, the long term effects of these infections are reduced cognitive abilities, intellectual capacity and lower work productivity. The warm and moist climate of tropical and subtropical countries provides the ideal environment for the survival of parasite eggs or larvae of these four STH, roundworm (*Ascaris lumbricoides*), whipworm (*Trichuris trichiura*) and hookworm (*Necator americanus*, *Ancylostoma duodenale*).

The prevalence and control of STH infections is inextricably linked with water quality, sanitation, hygiene practices and socio-economic status in the affected areas. Despite the fact that infection can be cured with either Albendazole or Mebendazole, eradication is difficult, given STH's feco-oral and penetration-via-skin transmission pattern as the chances of reinfection are very high in population living in affected areas. Control is achieved by targeted use of chemotherapy and improvement of sanitation, drinking water, use of pit-latrines instead of open defecation and good hygiene practices. India, with support from WHO, launched a Global Programme for the Elimination of Lymphatic Filariasis in the year 2000, Under this program Diethylcarbamazine (DEC) and Albendazole were administered to people living in filarial endemic areas. In 2015 another nation-wide Deworming Programme was launched covering nearly 241 million pregnant and children with STH infection or at risk of developing the infection. For such targeted efforts a comprehensive knowledge of the prevalence pattern of these helminth infections needs to be assessed thoroughly. Pregnant women are exposed to infection annually and approximately 4,00,000 pregnant women develop moderate or severe anaemia.

Soil transmitted helminths, especially hook worm infection is well known to cause anaemia. Data from the early 1990s suggested that 44 million of the developing world's 124 million pregnant women harbored hookworm infection. Hookworm infection is considered a major health threat to adolescent girls and women of reproductive age, with adverse effects on the outcome of pregnancy. There is still not enough literature in some parts of the world to understand the association between parasitic infections and anaemia among pregnant women. Therefore, this study was conducted to determine the current burden of parasitic infection and to assess the association between parasitic infection and anaemia among pregnant women, so that the outcomes of the findings can help in the evidence-based decision and to develop control intervention strategies to improve the health status of the most vulnerable groups i.e. pregnant women.

METHODS

STUDY AREA, DESIGN AND SUBJECTS

A Cross-sectional community based study was conducted in rural villages of Dharwad at Sattur and Navalur with a population of Sattur 52,872 with a female population of 22,346 and Navalur 7085 with female 3394 respectively. The area has a sub-humid, warm to hot climate, receives rain between 864 mm and 1300 mm annually and has a mean annual temperature of 21°C. The rainfall pattern of the area is long rainy season starting in June and extending up to September, while the short rainy season begins in March and extends to April/May. The main socio-economic activities of the local communities are mixed farming involving the cultivation of staple crops (maize, rice and corn combined with cattle. The study villages are located in Dharwad district. Houses are traditional type constructed of mud and wood, very few with bricks and cement plaster. Pregnant women were then selected from two rural villages using Systematic Sampling from the sampling frame, which was prepared after identifying the pregnant women and assessed through active detection using house- to- house visits . Sample size was determined based on the prevalence of anemia in pregnant women. The final sample size was 60. Pregnant women were identified with the support of ASHA health workers. Stool specimen collection and examination for intestinal parasites. After obtaining written consent from study participants, a single stool sample was collected from each participant. The study participants were provided with labeled screw capped stool containers and informed on how to collect about a 5g stool sample. The collected stool samples were immediately transported to SDM University Clinical Laboratory where they were processed following the standard procedure using the McMaster Concentration Technique. The type of parasite and parasitic load were also recorded, for Hematocrit determination Capillary blood samples were collected from all the pregnant women following aseptic technique. Hemoglobin concentration was determined by the Cyanmethemoglobin method. The hemoglobin cut of value for anemia according to the WHO guidelines is 11g/dl, which is approximately equal to 33% hematocrit value . Therefore, those pregnant women with HCT values less than 33% were categorized as anemic women.

ETHICAL CONSIDERATION

Ethical clearance of the study was obtained from the community and was sought before initiating the study by communicating the responsible zonal and district administrative offices through official letters. Similarly, community agreement and local oral consent was sought from village leaders through meetings with villagers. Individual informed oral and written consent were sought from each pregnant woman in the local language - Kannada, for all literate pregnant women. An independent literate witness from village leaders confirmed verbal consent for illiterate pregnant woman after the objectives and the

nature of the study were explained to the participants so as to get their oral and written consent to be involved in the study voluntarily. Data collected during the survey from each study participant and results of laboratory tests were kept confidential.

DATA COLLECTION:

Socio-demographic and socio-economic survey data were collected by trained data collectors, who were well conversant,(speak, read and write) with the local language (Kannada). They trained on how to interview and adhere to the survey protocol. Each pregnant woman resident in the study village was assigned a household number, name, identifying household member, age, and sex. The survey was conducted using a pre-tested, semi-structured questionnaire having both closed and open ended questions. The structured questionnaire was first developed in English and then translated into local language (Kannada) and administered in the local language to each pregnant woman.

The questionnaire was developed to address the following categories: Demographic characteristics, Socioeconomic factors, common human ailments in the area, STH related episodes and knowledge and perception questions related to STH transmission, causations, signs, symptoms, burden and severity of the disease, treatment seeking behavior, local prevention and control practices. A face- to- face interview schedule was arranged to collect relevant data from each pregnant women. Interviews were conducted privately to maintain confidentiality and avoid family and peer pressure.

DATA ANALYSIS

Data from both the laboratory and survey were checked for completeness and consistency. For the analysis of demographic data, Descriptive statistics was employed. Point estimation of prevalence and intensity of STH were computed to compare each of the two variables using Chi-square test. Multivariable logistic regressions were also employed for those variables that had significant association with disease outcome. Data collected during the survey from each study participant and results of laboratory tests were kept confidential. Results of participants with parasitic infections, intestinal helminth and low HCT level were sent, as soon as possible, health facilities for treatment and medical consultation in the ANC. Those pregnant women found infected were referred for treatment.

Table 1: Association of anemia with socio-demographic characteristics and environment related factors among pregnant women in Sattur and Navalur

N=60

Variable		n	Anemia		X ²	df
			Anemic	Non Anemic		
Place of residence	Semi-Urban	30	15	15	0.36	4
	Rural	30	40	20		NS
Age group	21-25	35	20	15	0.88	3
	26-30	30	10	20		NS
	31-35	25	20	05		
Occupation	Homemaker	20	08	12	1.58	6
	Farmer	10	06	04		NS
	Daily Laborer	35	18	17		
	Civil Servant	25	08	17		
Parity	Primigravida	48	25	23	3.65	4
	Multigravida	22	12	10		NS
	Third trimester	20	05	15		
Human feces as fertilizer	Yes	40	19	21	0.88	2
	No	50	28	22		NS
Habit of walking bare foot	Yes	65	29	36	0.02	2
	No	25	10	15		NS

* Significant at ($p < 0.05$).

* NS- Non Significant.

DISCUSSION

Anemia is one of the most common outcomes of STH infection. The prevalence of anemia was 53.9%; with minimum, maximum and mean Hematocrit values of 18%, 48% and 32.7%, respectively. A small variation from other studies may be due to the selection of study population. From the total of 60 anemic women; 10 (16.6%), 22 (36.6%), 28 (46.6%) were with mild, moderate and severe anemia, respectively. These findings are higher than the study conducted on pregnant women in Malaysia, which reported 45%, 9.8%, and 1.85% with mild, moderate and severe anemia, respectively. Our findings indicated that pregnant women from rural residences, those with STH infection were highly likely to be anemic compared to those from urban residences. In this current study those pregnant women who had a habit of

walking bare foot had high anemia prevalence (57.8%). Walking barefoot may predispose to hookworm infection and consequently may result in iron deficiency anemia especially in pregnant women. Hookworm infection rate was also associated with anemia in which those pregnant women infected with hookworm have a 2.4 times higher risk of developing anemia, as 68.4% of the pregnant women infected with hookworm were anemic. There was a significant correlation between increasing hookworm parasite load, *A. lumbricoides* and *T. trichiura* and decreasing hematocrit values. This shows that as the helminth parasitic load increased the hematocrit level decreased; as a result the risk of developing anemia is increased. In this study prevalence of anemia in pregnant women was higher in STH infected pregnant women, which is in agreement with the findings of many studies. The limitations of the current study are, even though this study tried to address some important factors, other factors, such as other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production or red blood cell survival, which can all cause anemia, were not addressed.

CONCLUSION

Anemia, STH infection are currently serious health problems of pregnant women living in Dharwad. STH infections were found to be significantly associated with anemia in the study area. The severity of anemia is pronounced more when pregnant women are infected. The high prevalence of STH indicates it is currently a serious health problem of pregnant women living in rural area. Antenatal care should promote De-worming and education on personal hygiene. Therefore, there is a need to design strategies that would help to diagnose pregnant women for STH infection during their antenatal care (ANC) visit instead of testing only for Hemoglobin (Hb) level and blood group.

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