



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating 2017: 5.03  
TPI 2017; 6(9): 334-336  
© 2017 TPI  
www.thepharmajournal.com  
Received: 29-07-2017  
Accepted: 30-08-2017

**Susheela Somappa Halemani**  
Assistant Professor, Subbaiah  
Institute of Medical Sciences,  
Shimoga, Karnataka, India

**Abhishek Acharya**  
Associate Professor, Subbaiah  
Institute of Medical Sciences,  
Shimoga, Karnataka, India

**Prabhakar Adake**  
Assistant Professor, Yenepoya  
Medical College, Mangaluru,  
Karnatak, India

**Sohit Anan**  
Therapy Area Lead Oncology  
and Respiratory Boehringer  
Ingelheim India Pvt. Ltd.

**Kiran Lakkol**  
Professor, SSIMS, Davangere,  
Karnataka, India

**Shivashankar Murthy**  
Professor, SSIMS, Davangere,  
Karnataka, India

#### Correspondence

**Abhishek Acharya**  
Associate Professor, Subbaiah  
Institute of Medical Sciences,  
Shimoga, Karnataka, India

## Evaluation of effect of parity on hemoglobin levels in anaemic pregnant women

**Susheela Somappa Halemani, Abhishek Acharya, Prabhakar Adake, Sohit Anand, Kiran Lakkol and Shivashankar Murthy**

#### Abstract

**Objectives:** To evaluate the effect of parity on Hb levels in anaemic pregnant women receiving oral iron therapy.

**Method:** In this observational study, all anaemic pregnant women who attended OPD were prescribed with oral iron therapy i.e., based on Hb levels. They were grouped based upon parity as primiparous or as multiparous with undertaking of the consent and were followed up for next three months. After recording the baseline data, Hb levels and weight at the end of each month were recorded.

**Results and Discussion:** Changes in mean Hb levels from baseline to three months are  $1.687 \pm 0.85$ ,  $1.811 \pm 0.67$  in primi and multiparous respectively. Study did not show statistically significant difference in terms of change in Hb or weight among primi and multiparous women. But gain in Hb and weight after 3 months was statistically highly significant in comparison to baseline values in both groups with  $P < 0.001$

**Conclusion:** Increase in Hb levels with oral iron therapy in anaemic pregnant women is statistically significant compared to baseline values irrespective of parity.

**Keywords:** Hemoglobin, parity, anaemia, pregnancy, weight.

#### Introduction

Iron-deficiency anemia is a global health problem, where pregnant women represent one of the most vulnerable groups, due to the enhanced iron requirement to meet mother's and the fetus' needs [1] As per World Health Organization (WHO) the prevalence of anaemia among pregnant women is estimated to be 8.3% in developed countries while in developing countries, it varies between 53.8% and 90.2% [2]

In India, more than 90% of anemia cases are estimated to be due to iron deficiency, may be because of high iron requirements that are not easily fulfilled because of a diet poor in absorbable iron and iron losses due to frequent parasitic infections [3]. Religious reasons, ignorance, poverty, vegetarian diet and gender bias also contribute to its high prevalence [4-6].

Since prematurity, low birth weight, and higher maternal and perinatal mortality rate stand out as harmful consequences of anemia during the gestational period, this forms major point of concern [7-9] The frequencies of these complications further varies among primiparity (first time mother) and multiparity status. High parity is one among the factors with etiologic potential in causing anaemia in pregnancy (AIP) [10]

Hence current WHO guidelines recommend that all pregnant women in areas where anaemia is highly prevalent should receive supplements of both iron and folic acid [11]

Clinical trials of prenatal iron supplementation have shown improvement in Hb concentration, but evidence of parity affecting hemoglobin values with oral iron therapy has been found to be inconclusive. Prior studies provided inconsistent evidence regarding the question of whether high parity is associated with AIP or not. While some studies found that increasing parity was associated with an increase in the risk of AIP [12-15] Others reported no evidence of such an association with it [16-19]

This study is picked to evaluate overall effect of use of iron with folic acid, on maternal haemoglobin and weight gain both in primiparous and multiparous anaemic women.

#### Materials and Methods

An open label, observational study designed to conduct for a period of six months in pregnant women visiting OBG department of Chigateri hospital attached to JJM Medical College, Davangere.

100 patients were added to the study, screening went on as per the inclusion criteria. After filling the informed consent form, pregnant women were asked to attend OPD at regular predetermined dates for ANC. They were grouped based on parity as primiparous or as multiparous.

Women were instructed at their first visit to report for the follow up for successive three months on monthly basis. To improve the follow up rates they were informed over the phone a day prior to attend OPD on prefixed visit dates. At each visit, Hb level were assessed using Sahli's hemoglobinometer and weight were recorded.

Out of 100 patients 7 patients were lost to follow up hence only 93 patients were included in final statistic analysis.

Group A: primiparous ladies

Group B: multiparous ladies

**Inclusion criteria:** Pregnant women not taking any iron preparations.

Pregnant women with gestational age less than 6 months.

Anaemia with  $Hb \leq 10.5 \text{ gm\%} \geq 8 \text{ gm\%}$

**Exclusion criteria:** High risk pregnancy with cardiac and other complications.

Multiple pregnancies

Severe anaemia

**List of safety measurements**

- Hb assessment were be done under aseptic precautions.
- Informed consent was taken.
- Approval of ethical committee was obtained.

**Results**

**Table 1:** Comparison of baseline Hb and Hb gain after 3 months

	Baseline Hb	Hb gain	Statistical analysis		
			Sig. (2-tailed)**	t value	(Mean + S.D)
Primi (Mean ± S.D)	9.132±1.0546	1.687±.8597	$P<0.001$	22.574	7.4452±1.8363
Multi (Mean ±S.D)	8.604±.8694	1.811±.6773	$P<0.001$	24.848	6.7929±1.4466

**Table 2:** Comparison of baseline weight and weight gain after 3 months

	Baseline weight	Weight gain	Statistical analysis		
			Sig. (2-tailed)**	t value	(Mean + S.D)
Primi (Mean ± S.D)	46.68±7.035	7.13±1.727	$P<0.001$	29.237	39.548±7.531
Multi (Mean ±S.D)	49.14±9.172	6.46±1.688	$P<0.001$	23.120	42.679±9.768

**Table 3:** Comparison of Hb gain among 3-4 MOA and 5-6 MOA

Hb gain	Primi (Mean ± S.D)	Multi (Mean ±S.D)	Statistical analysis		
			Mean Difference + SE of Diff	t value	P value
3-4 MOA	1.775±0.9498	1.747±0.6818	-0.0276±0.2928	-0.094	0.925
5-6 MOA	1.944±0.6876	1.607±0.7173	-0.3373±0.3017	-1.118	0.276

**Table 4:** Weight gain in 3-4 MOA and 5-6 MOA

Weight gain	Primi (Mean ± S.D)	Multi (Mean ±S.D)	Statistical analysis		
			Mean Difference ± SE of Diff	t value	P value
3-4 MOA	6.76±1.865	6.47±1.645	-0.276±0.639	-0.433	0.668
5-6 MOA	6.44±1.878	7.57±1.505	1.127±0.708	1.592	0.126

\* Paired t-test

\*\*  $p<0.001$ - highly significant

MOA: Months of ammenorrhoea.

**Discussion**

In our study mean age of primi women was 22.9 years, while in multi women 24.5 years. There was statistical significant difference between primiparous and multiparous with reference to their age ( $p<0.001$ ). Majority of primiparous mothers falls in 18-24 yrs of age group (51.61%), whereas 53.58% of multiparous were in 25-30 years.

At baseline significant difference in Hb was observed in both primi and multi the p value  $\leq 0.041$  with mean baseline values being  $9.132 \pm 1.05 \pm 1.05$  and  $8.604 \pm 0.86$  respectively. This could be attributed to depletion of iron stores in previous pregnancies, inadequate spacing between consecutive pregnancies.

Change in mean Hb levels from baseline to three months is  $1.687 \pm 0.85$ ,  $1.811 \pm 0.67$  in primi and multiparous respectively with the p value 0.545. Similarly weight gain comparison among primi and multi  $7.13 \pm 1.7$  and  $6.46 \pm 1.6$  respectively showed p value 0.141.

Study did not show statistically significant difference in terms of change in Hb or weight among primi and multiparous

women. But gain in Hb and weight after 3 months was highly statistically significant in comparison to baseline values in both groups with  $P<0.001$

Global statistics reveals that India stands highest in the rank list of anaemia prevalence. It is estimated that about 20-40% of maternal deaths in India are due to anaemia, also our country contributes to about 50% of global maternal deaths due to anaemia [20, 21] Anaemia is a major public health concern specially in pregnancy.

As per previous studies, primiparous pregnancies were found to be at a higher risk of AIP compared to pregnancies with parity of  $\geq 2$ . [22] Our result corroborates those of other studies, which found lower Hb concentrations in pregnant women with a higher number of previous pregnancies [23]

As per study done by Prechapanich and Tongtub the prevalence of anemia was higher in women with multiparity, which could have been due to depletion of iron stores in previous pregnancies, inadequate spacing between consecutive pregnancies and inadequate protein and caloric consumption due to unavailability of proper share of nutrition

and negligence due to care for other children and households by the multiparous group [24] Conversely, Idowu *et al.* [25] observed that prevalence of anemia was higher in primiparous mothers.

Prior studies provided inconsistent evidence regarding the question of whether high parity is associated with AIP or not. While some studies found that increasing parity was associated with an increase in the risk of AIP [12-15] others reported no evidence of such an association [16-19] Similar findings were observed from our study.

In our study also we did not find any association between parity and AIP and its outcomes after oral iron therapy.

### Conclusion

In this comparative study, the results showed that in both primiparous and multiparous group there was a significant increase in Hb, weight gain with oral iron therapy, but group comparison did not show any statistical significant difference. Study observes that oral iron therapy in anaemic pregnant women improves Hb levels independent of parity of women. Parity does not appear to affect anaemic status in a dose-response fashion.

Anaemia in pregnancy is an issue which requires research studies followed by lots of efforts to reverse the present trend in maternal health seeking behavior if significant improvement in maternal health is to be achieved.

### Drawbacks

- This study explores the controversial association between parity and anaemia-in-pregnancy (AIP) but hasn't distinguished incident cases caused by pregnancy from prevalent cases complicated by pregnancy.
- Womens' diets were not analysed in the present study.
- Groups were not homogeneous in terms of the "gestational age in the beginning of prenatal care" variable the frequency of anaemia and haemoglobin levels were not stratified by gestational trimester

**Conflict Of Interest:** None

### Acknowledgement

I would like to thank my teachers, friends, Dept of Pharmacology, Dept. of OBG, JJMMC Davangere without them the study wouldn't have been possible.

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