

## A Prospective Observational Study To Assess The Risk Factors Of Congenital Hypothyroidism And Impact Of Patient Counselling On Improving Knowledge, Attitude And Practice Of The Disease In Post Natal Mothers.

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Date of Submission: 15-07-2021

Date of Acceptance: 31-07-2021

### ABSTRACT

**Background:** Congenital hypothyroidism (CH) is one of the most common endocrine disorder and one of the causes of congenital mental disability, which can be prevented in the case of early diagnosis and treatment. The only effective way to diagnose CH is screening by laboratory methods, such as thyroid-stimulating hormone (TSH) or free thyroxine (T4) measurement.

**Methods:** The study was carried out in 55 babies who were diagnosed with hypothyroidism and their mothers from the neonatology department of tertiary care hospital at Thiruvananthapuram. Informed consent was obtained. Details were collected using specially designed proforma. Risk factors were assessed through information which was collected from case records and through direct interview with caregivers. Questionnaire for assessing knowledge, attitude and practice were given to postnatal mothers. Knowledge, attitude and practice before and after counselling is obtained.

**Results:** A total of 55 babies with congenital hypothyroidism and their mothers fulfilling the study criteria were included. Risk factors were assessed using ANOVA. Using paired t-test, statistical analysis clearly depicts that there is a significant improvement in knowledge, attitude and practice of congenital hypothyroidism in postnatal mothers as well as combined with significant p-value <0.05.

**Conclusion:** From this study it is concluded that most of the postnatal mothers of babies with congenital hypothyroidism had shown a considerable improvement in knowledge, attitude

and practice of the disease after counselling. Pharmacist intervention in the form of counselling is hence an integral factor in improving the knowledge, attitude and practice of congenital hypothyroidism in postnatal mothers. And the most common risk factors were mother's age, preterm delivery, maternal hypothyroidism, multiple pregnancies, medication during pregnancy, gender

### I. INTRODUCTION

Congenital hypothyroidism is defined as thyroid hormone deficiency at birth. Congenital hypothyroidism (CH) is one of the most common endocrine disorders and one of the causes of congenital mental disability, which can be prevented in the case of early diagnosis and treatment<sup>[1]</sup>. The only effective way to diagnose CH is screening by laboratory methods, such as thyroid-stimulating hormone (TSH) or free thyroxine (T4) measurement<sup>[2]</sup>.

Screening programs for CH have been extensively implemented in developed countries which provide the opportunity to investigate the etiology and pathogenesis of CH<sup>[2]</sup>. According to the American Academy of Pediatrics (AAP), normal T4 and high TSH, which do not cause neurological defects based on evidence, can be due to either thyroid dysfunction (permanent or transient), or delay in the development of hypothalamic-pituitary axis<sup>[3]</sup>. Thyroid tests can be conducted at the age of 2-4 weeks and the treatment starts if TSH remains high. Studies have

shown that the incidence of CH is 1 per 3,000-4,000 births worldwide<sup>[4]</sup>.

A great number of study conducted on the identification of CH risk factors suggested the effects of several genetic and environmental factors on the onset of the disease. These factors include maternal hypothyroidism, multiple pregnancies, preterm delivery, mother's age, gender, birthweight, prenatal drug abuse, parental educational level<sup>[5]</sup>.

As the occurrence of genetic mutation has been observed in a small proportion of patients, its etiology is largely unknown. Therefore investigation of risk factors of CH is important because of the potential to prevent the disease<sup>[6]</sup>.

This study highlights most common risk factors of congenital hypothyroidism and impact of patient counselling on improving knowledge, attitude and practice in post natal mothers.

## II. MATERIALS AND METHODS

**2.1 Data source:** All the relevant information regarding the study was collected from case records and direct interview with care givers. Data from

case records and care givers was collected by using suitably designed proforma. The study was approved by Research and Ethical Committee of Cosmopolitan hospital, Trivandrum

**2.2 Study population:** Neonates were taken from neonatology department of cosmopolitan hospital. Informed consent was obtained. The study was conducted for the period of 6 months

**2.3 Assessment of risk factors:** Details were collected from case records of the babies and direct interview with the caregivers.

**2.4 Impact of patient counselling:** Mothers of babies diagnosed with congenital hypothyroidism are included in this study. They were provided with a questionnaire to assess the knowledge, attitude and practice on congenital hypothyroidism. Knowledge, attitude and practice before and after counselling is obtained

**2.5 Statistical Analysis:** Risk factors were assessed using ANOVA.

Assessment of knowledge, attitude and practice of congenital hypothyroidism in post natal mothers were done using paired t test.

## III. RESULT

### ASSESSMENT OF RISK FACTORS

#### Distribution of patients based on Gender.

The distribution of patients based on Gender have been shown on the following table:

Table 1: Frequency and Percentage distribution of patients based on gender.

GENDER	FREQUENCY	PERCENTAGE
Male	21	38%
Female	34	62%
Total	55	100

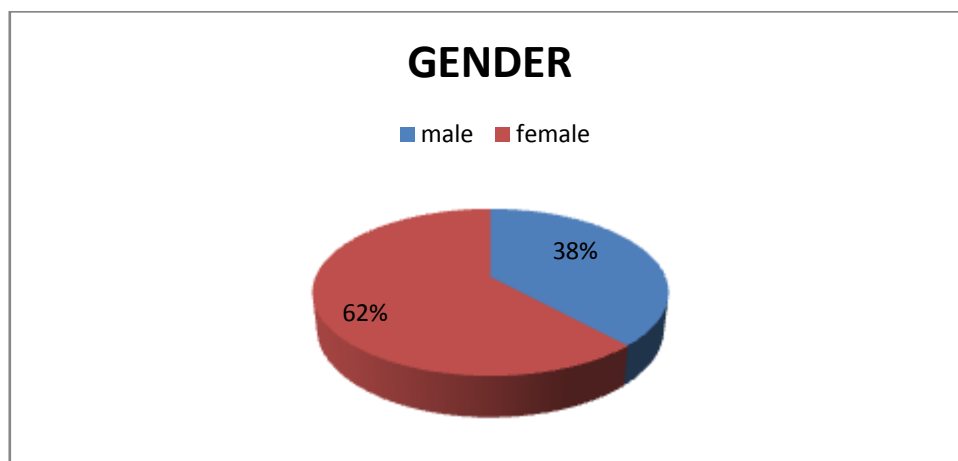


Figure 1: Diagrammatic representation of percentage distribution of patients based on gender.

From Table 1, it was observed that out of total 55 babies, 21 (38%) were male and 34 (62%) were female . Thus, we found that there is higher chances of occurrence of congenital

hypothyroidism in female gender.

**Age distribution of mothers**

The distribution of age of mothers of the babies are shown in the following table

Table 2: Frequency and Percentage of age distribution of mothers.

AGE IN YEARS	FREQUENCY	PERCENTAGE
<30	26	47
≥30	29	53
Total	55	100

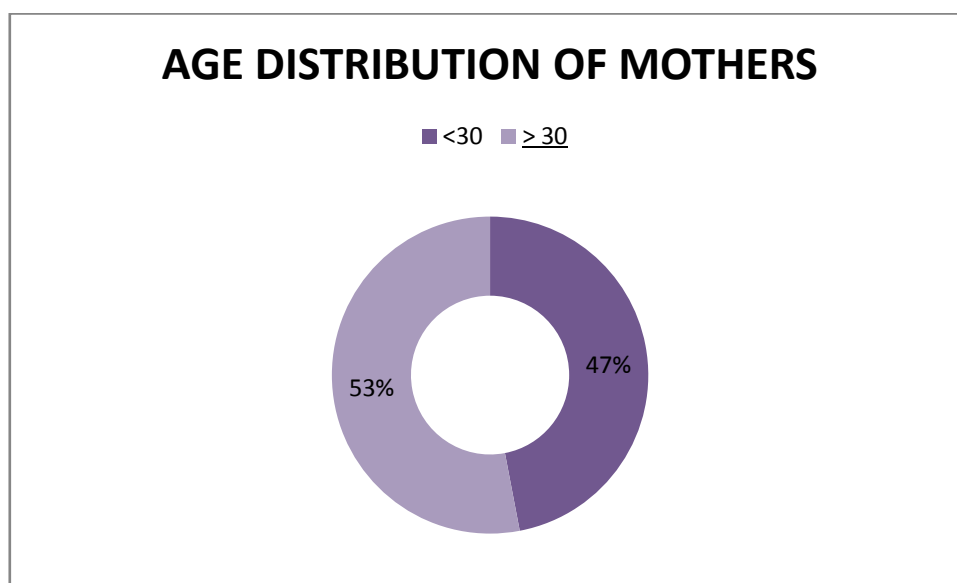


Figure 2: Diagrammatic representation of percentage distribution of age of mothers.

From table 2 ,we observed that 29 mothers shown age of ≥30 years which is about 53%. 26 mothers shown age <30 years which is about 47%. This shows that when mothers age increases, there is an increased chance of occurrence of hypothyroidism in their babies.

Mothers age is an important risk factor in the occurrence of the disease.

**Other Risk factors**

The distribution of other risk factors are shown on the following table:

Table 3: Frequency and Percentage distribution of other risk factors.

RISK FACTORS	FREQUENCY	PERCENT
Preterm	24	44
Maternal hypothyroidism	43	78
Medication during pregnancy	18	33
Multiple pregnancy	7	13

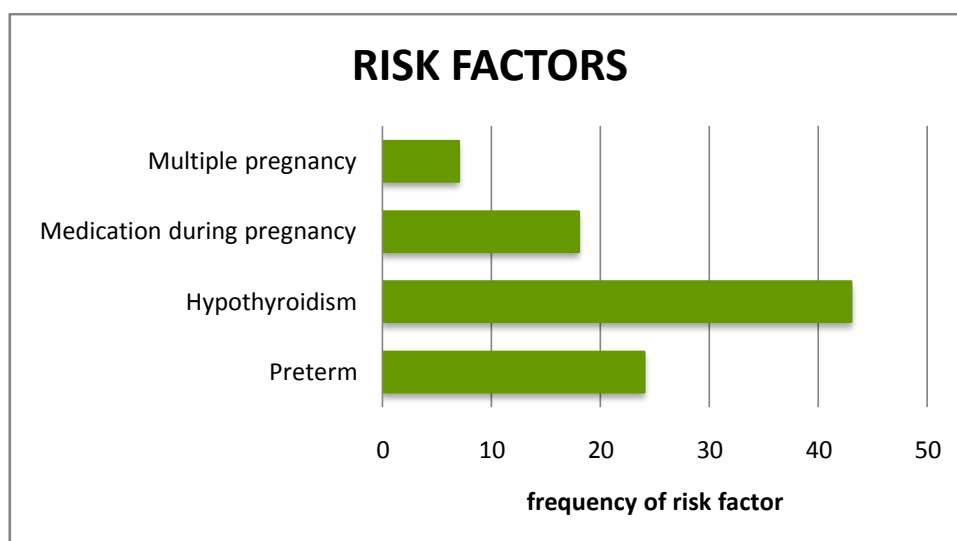


Figure 3: Diagrammatic representation of Frequency of distribution of risk factors of congenital hypothyroidism

From table 3, it was observed that out of 55 babies 24 were preterm. That is about 44% risk is there for the occurrence of congenital hypothyroidism in pre-term babies. 43 babies had a risk of maternal hypothyroidism. So there is 78% risk for the occurrence of congenital hypothyroidism in babies with a mother having hypothyroidism. Only 18 babies were at a risk of medication during pregnancy. This shows that only 33% risk for the occurrence of the disease. Only 7 mothers shown multiple pregnancies, so the risk for the occurrence of the disease was found to be 13%.

#### Impact of Patient Counselling on Knowledge, Attitude and Practice

The impact of patient counselling on Knowledge, Attitude and Practice was assessed using validated KAP questionnaire and analyzed by paired t test.

In this study, a total of 55 post natal mothers of babies with congenital hypothyroidism were assessed for knowledge, attitude and practice of the disease before and after giving counselling.

Table 4 : Percentage distribution of knowledge before and after counselling

KNOWLEDGE	PRE TEST		POST TEST	
	n	%	n	%
Poor	17	31	0	0
Average	38	69	0	0
Good	0	0	35	64
Excellent	0	0	20	36
Total	55	100	55	100

From table 4, On assessing knowledge before counselling, 17 subjects shown poor knowledge. That is about 31%. 38 subjects shown average response which is about 69% When

knowledge was assessed after counselling, 35 among the subjects shown good response which is about 64% and 20 shown excellent response which is only 36% .

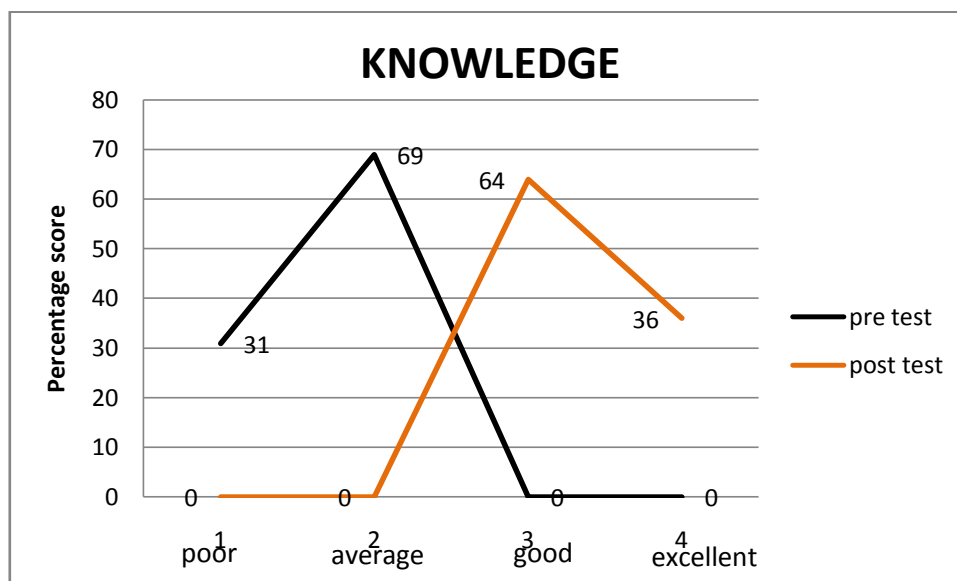


Figure 4 :Diagrammatic representation of Percentage distribution of knowledge before and after counselling

Table 5: Percentage distribution of attitude before and after counselling.

ATTITUDE	PRE TEST		POST TEST	
	n	%	n	%
Poor	15	27	0	0
Average	40	73	0	0

Good	0	0	21	38
Excellent	0	0	34	62
Total	55	100	55	100

On assessing attitude before counselling, 15 subjects shown poor attitude. That is about 27%. 40 subjects shown average response which is about 73%. When attitude was assessed

after counselling, 21 among the subjects shown good response which is about 38% and 34 shown excellent response which is 62%.

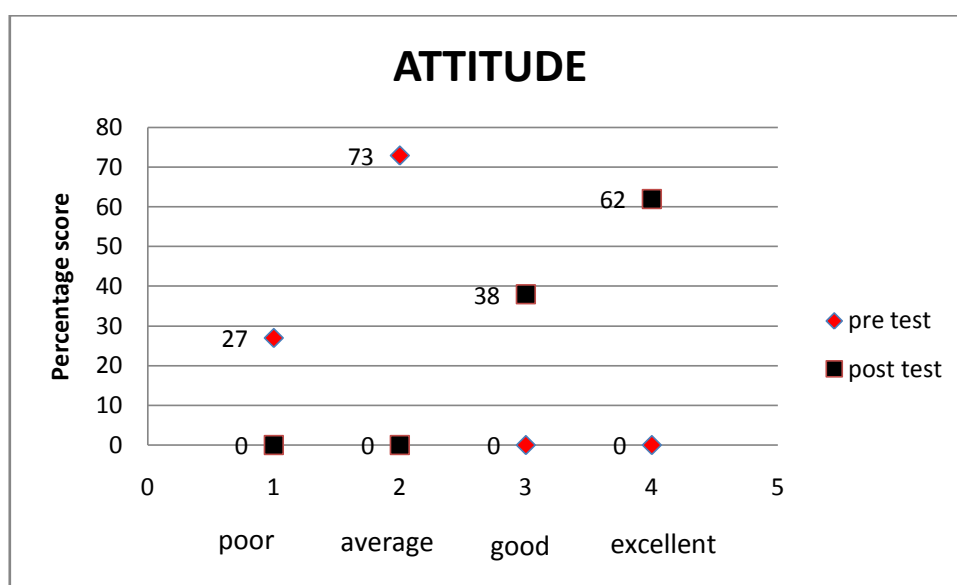


Figure 5 :Diagrammatic representation of Percentage distribution of attitude before and after counselling

Table 6 : Percentage distribution of practice before and after counselling

PRACTICE	PRE TEST		POST TEST	
	n	%	n	%
Poor	14	25	0	0
Average	41	75	0	0
Good	0	0	21	38
Excellent	0	0	34	62
Total	55	100	55	100

On assessing practice before counselling, 14 subjects shown poor practice. That is about 25%. 41 subjects shown average response which is about 75%. When practice was assessed after

counselling, 21 among the subjects shown good response which is about 38% and 34 shown excellent response which is only 62%.

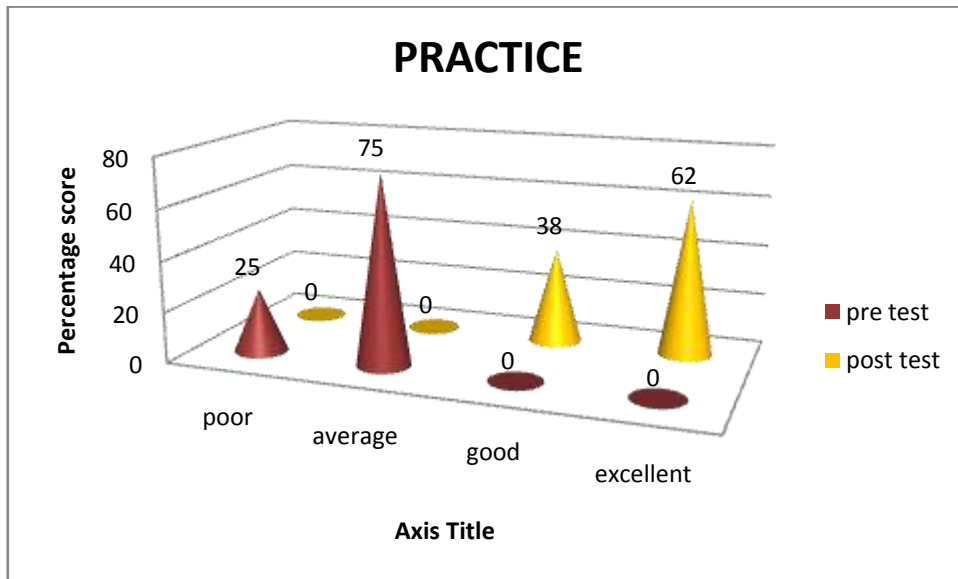


Figure 6 :Diagrammatic representation of Percentage distribution of practice before and after counselling

Table 7 : Improvement in knowledge after intervention

	N	Knowledge score		Paired t test	
		mean	sd	t	p
Pretest	55	6.98	2.32	35.47	0.0001
Post test	55	16.85	3.35		

Average knowledge score in pretest was 6.98±2.32 and the average knowledge score after intervention was 16.85±3.35. The observed

difference was statistically significant (p<0.05). There was a significant improvement in knowledge score after intervention.

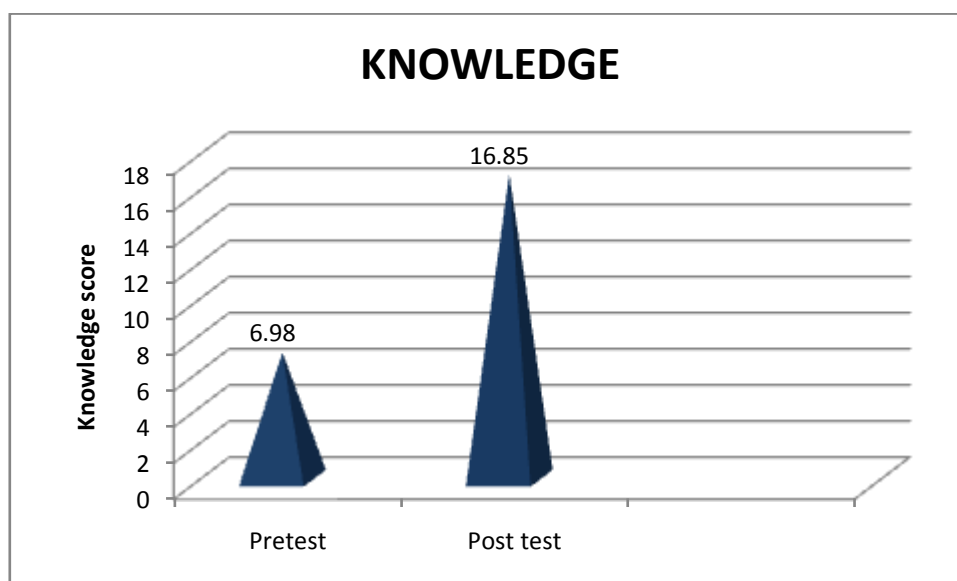


Figure 7 : Diagrammatic representation of Improvement in knowledge after intervention

Table 8 : Improvement in attitude after intervention

	N	Attitude score		Paired t test	
		mean	sd	t	p
Pretest	55	2.13	0.82	29.012	0.0001
Post test	55	6.25	1.46		

Average attitude score in pretest was  $2.13 \pm 0.82$  and the average attitude score after intervention was  $6.25 \pm 1.46$ . The observed difference was statistically significant ( $p < 0.05$ ). There was a significant improvement in attitude score after intervention.



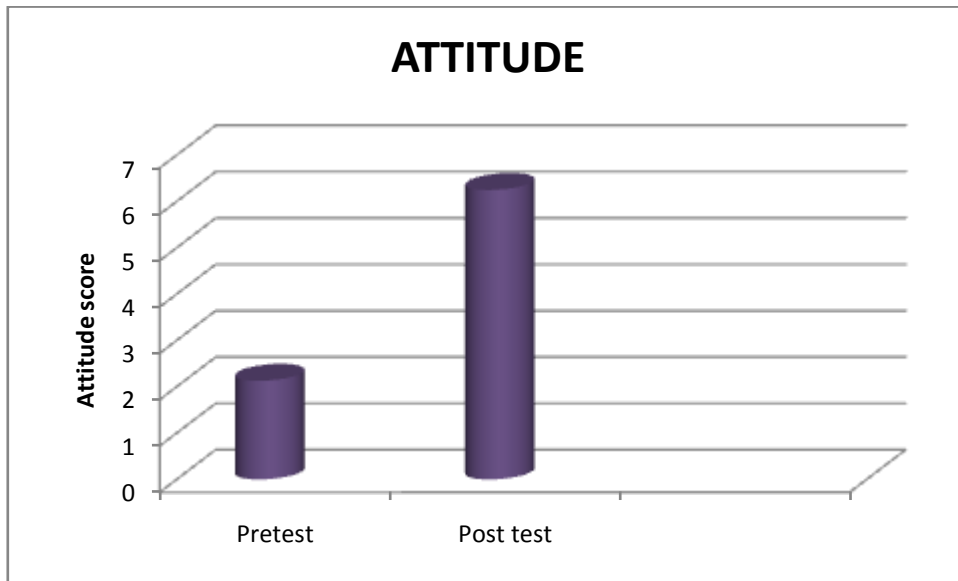


Figure 8 :Diagrammatic representation of Improvement in attitude after intervention

Table 9 : Improvement in practice after intervention

	N	Practice score		Paired t test	
		mean	sd	t	p
Pretest	55	5.00	1.66	22.125	0.0001
Post test	55	12.44	2.97		

Average practice score in pretest was  $5.00 \pm 1.66$  and the average practice score after intervention was  $12.44 \pm 2.97$ . The observed difference was statistically significant ( $p < 0.05$ ). There was a significant improvement in practice score after intervention.

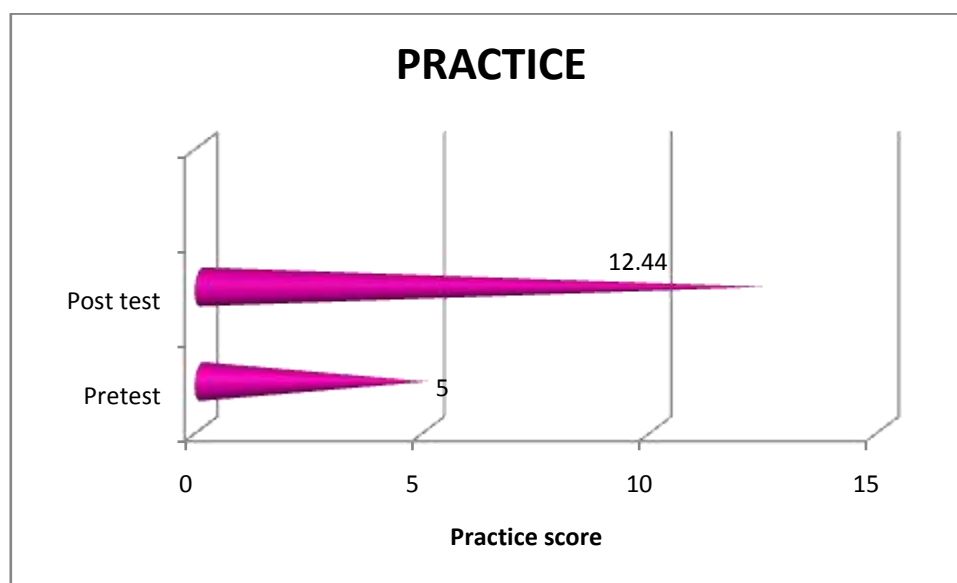


Figure 9 : Diagrammatic representation of Improvement in practice after intervention

#### IV. DISCUSSION

In the study done by B.Tariq et al, study demonstrated a remarkable improvement in knowledge about the disease( from 20% to 97%). A similar improvement from 58% to 79% was observed in attitude towards CH screening in terms of opting for screening test following intervention. This study was translated into a corresponding change in practice with 74% of responds getting done<sup>[7]</sup>.

In our study ,we assessed the knowledge,attitude and practice before and after giving counselling to post natal mothers. Before giving counselling most subjects had poor or average response towards knowledge,attitude and practice. But ,after counselling subjects shown good and excellent response towards knowledge,attitude and practice in post natal mothers.

Our study demonstrated a remarkable improvement in knowledge,attitude and practice in post natal mothers about congenital hypothyroidism.

Ahmed Mahmoud Abdelmuktader et al. conducted a study on “ Risk factors for congenital hypothyroidism in Egypt: Results of a population case- control study (2003- 2010) “.One control was selected for each congenital hypothyroidism affected infant. It was observed that there was association of CH with birth defects, female gender, gestational age greater than 40 weeks, and gestational diabetes. An increased risk for CH was detected in twins by multivariate analysis. This

study suggests that genetics and environmental factors play a role in development of the disease<sup>[8]</sup>

FaridehJamshidiMoghadam et al. conducted a study on “Investigation of risk factors associated to congenital hypothyroidism in Mahshahr city between 1389-1395 and presentation of a preventive model”. Newborns suffering from congenital hypothyroidism were selected by a case control study and the required information was collected by questionnaire. The study showed that fetal age below 37 weeks, birth weight and history of thyroid disease in family increased chances of the disease. Hence thyroid test during pregnancy and screening test for children as well as treatment of mothers with thyroid disease in pregnancy is necessary<sup>[9]</sup>.

Mi Lim Chung et al. conducted a study on “ Incidence and risk factor of permanent hypothyroidism in preterm infants”. This was a retrospective study in which review of medical records of preterm infants was performed. The study concluded that thyroid dysfunction was common in preterm infants and nearly 80 percent of infants showed transient hypothyroidism. Hence if no other risk factor was found, an earlier trial off therapy was considered for premature infants<sup>[10]</sup>.

AneelaAnjum et al. conducted a study on “ Congenital hypothyroidism in neonates “. This was a cross sectional study which was conducted in neonatal units”. Demographic data and relevant history was recorded.Venous blood samples were taken for TSH measurements. Out of 500 newborns 0.8 percentnewborns had elevated TSH levels. Moreover it was found that Congenital

hypothyroidism had a significant association with mothers hypothyroidism and mothers drug intake during pregnancy period<sup>[11]</sup>.

Rosanna Rovelli et al. conducted a study on “Newborns of mothers affected by autoimmune thyroiditis, the importance of thyroid function monitoring in first months of life.” Neonates were tested for thyroid function by measuring free thyroxine and TSH in 3<sup>rd</sup>, 5<sup>th</sup> days and at one month of life. It was observed that a transient mild elevation of TSH was seen in first month of life in infants born to mothers with autoimmune thyroiditis. Persistent hyper thyrotropinemia requiring replacement therapy was observed in 2.2 percentage of these neonates. Hence follow up was the recommended and most accurate way to monitor these infants and also serum testing TSH between second and fourth week of life<sup>[12]</sup>.

In our study we assessed the most common risk factors for the occurrence of congenital hypothyroidism in neonates. It was found out to be age of mothers, gender of baby, preterm delivery, maternal hypothyroidism, medication during pregnancy, multiple pregnancy.

Mothers who were having an age above 30 years had a risk of 53%. Female babies had a risk of 62%. 44% pre-term babies had a risk of congenital hypothyroidism. The most commonly seen risk factor were maternal hypothyroidism which was about 78%. Medication during pregnancy had shown 33% of risk. Only 13% risk were there for multiple pregnancy.

## V. CONCLUSION

From this study it is concluded that most of the post natal mothers of babies with congenital hypothyroidism had shown a considerable improvement in knowledge, attitude and practice of the caregivers. This showed that the caregivers became more aware of the disease and its complications. They also became aware of the importance of screening test of CH which may reduce the occurrence of the disease in the future.

And the most common risk factors were mother's age, preterm delivery, maternal hypothyroidism, multiple pregnancies, medication during pregnancy, gender.

The early detection and appropriate treatment of CH is associated with normal neurodevelopment. If the diagnosis is made and treatment started within a few weeks of birth, neurodevelopmental outcome generally is normal. Since this is a limited period study, it does not prioritize the identification of

permanent and transient congenital hypothyroidism.

Therefore, a larger sample size and a longer duration of study are necessary for better and reliable results.

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