Report on

Knowledge, Attitude and Practice of Women and Screening of Iodine Deficiency Disorder (IDD) among Pregnant Women in District Hospital of Myagdi, Nepal

Submitted to

Society for Eliminating Nepalese Iodine Deficiency (SENID),

Osaka, Japan

Submitted by

Public Health and Infectious Disease Research Center

(PHIDReC)

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Study Team

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Summary

This study was designed to determine the status of Iodine Deficiency Disorders (IDD) among pregnant women who are at risk of IDD. A total of 80 pregnant women from Myagdi District Hospital, Beni were included in the study. Urine samples were collected from pregnant women. The urine samples were analyzed for urine iodine estimation. In addition, focus group discussion was conducted among women and inhabitants of three village development committees of Myagdi district to assess the knowledge, and practices on iodine and IDD, and to provide nutrition education on iodine and iodized salt. Although the knowledge and practices of women on iodized salt was satisfactory, the urinary iodine excretion revealed that still one fifth of pregnant women had insufficient iodine intake. This indicates that the identified at risk population of IDD are still significant proportion in the population and these issues should be addressed by concerned government agencies and other stakeholders.

Acknowledgements

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We would like to express sincere thanks to pregnant women who provided us information and allowed us for collection of urine samples.

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PHIDReC Team
May, 2013
Kathmandu

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Introduction

1.1 Background

Iodine Deficiency Disorder (IDD) is the world's single most significant cause of preventable brain damage and mental retardation. Twenty nine percent of the population (1570 million people) is at risk of iodine deficiency today in the world. The immense danger to health due to IDD arises from the fact that these disorders can began even before the child is born. Although iodine is needed in small amount on an average of 150 mcg (100 to 300) per person per day, [1, 2] lack of iodine is associated with wide range of clinical and sub-clinical conditions. The most obvious sign of IDD is goiter, which is a gross enlargement of the thyroid gland in the neck, with a global prevalence of 12%. In addition to goiter, IDD leads to infant mortality, stillbirths, birth complications, mental retardation and depressed psychomotor functions. Moderate IDD in early childhood has been estimated to lower the intelligence quotient by about 10-15 points, while in adults it causes lethargy. [3]

IDD is an important major micronutrient deficiency problem in Nepal. In some isolated mountainous area of Nepal, most of the adult woman had goiter and up to 10% of population were cretins, the severest form of IDD. [4] IDD status assessment conducted in 2004 in Nepal noted that 16.3 percent household salt samples were found to have less than 15 ppm iodine, 35.33 percent samples found to have 15 to 30 ppm, 40 percent samples were found to have 30-50 ppm and 12.64 percent salt samples had iodine greater than 50 ppm.

In areas with severe iodine deficiency (<50 mcg intake/day), goitrogenesis as well as hypothyroidism were frequently observed in mother and newborn as a result of the inability

of the thyroid gland to adjust to changes in thyroid economy associated with pregnancy. Hence, the pregnant woman and the newborn have been considered primary targets for iodine supplementation in such areas.[5] Ministry of Health and Population has prioritized Iodine Deficiency Disorders as a high level activity in its Nutrition Policy and Strategy 2004. By the year 2017 iodine deficiency disorders will be eliminated virtually from Nepal. [7]

We implemented iodine supplementation among pregnant mothers in Antenatal Care (ANC) Clinic of Chautara Hospital Sindhupalchowk. We found significant positive outcome in mothers and children born from iodine supplemented mothers.

All these findings associated with pregnant women justify the burning issue for the research on iodine deficiency disorders among pregnant mother and newborn. With these motivations, this study has been designed to screen among pregnant women and newborn in Beni Hospital Myagdi in 2012 and 2013 analyzing urinary iodine. This study also provides health education to the women of rural community regarding the use of two children logo containing iodized salt.

1.2 Objectives

To determine the status of Iodine Deficiency Disorders (IDD) in pregnant women in Beni Hospital Myagdi.

Specific objectives

1. To determine the status of IDD among pregnant women analyzing urinary iodine excretion.
2. To assess knowledge, attitude and practice of women on iodine and iodine deficiency disorders.
3. To provide health education to pregnant mothers and mother's group in the rural community regarding iodized salt and IDD.

Chapter-II

Methodology

2.1 Research design

This cross-sectional study is being conducted to determine the status of IDD among pregnant mothers in Beni Hospital Myagdi from March 2013. In addition, knowledge, attitude and practices of women were assessed through qualitative study.

2.2 Study site

The site of this study is Beni Hospital Myagdi. Myagdi district is situated in hilly ecological region of Western Region of Nepal. For qualitative study, three VDCs namely Arthunge, Pulachaur and Singa were included.

2.3 Sample size and sampling

We are planning to enroll 100 pregnant mothers in Myagdi district hospital who will attend for antenatal care from March 2013 to May 2013.

For qualitative study, a total of 48 women in three groups were included for focus group discussion and health education classes on iodine and IDD. The community people including teachers, social leaders and female community health volunteers (FCHVs) also participated in the discussion and health education class.

2.4 Selection of pregnant women

Eighty pregnant women who attend Beni Hospital Myagdi for antenatal care were included in

the study.

2.5 Collection of urine samples

Auxiliary Nurse Midwife (ANM) and health assistant (HA) of Myagdi district hospital were trained on collection of urine samples and required data in the questionnaire. Urine samples were collected from 80 pregnant women in the hospital for the analysis of Urinary Iodine Excretion (UIE) to screen IDD status. The urine samples were collected in clean leak proof container. The collected urine samples were kept in refrigerator at -20^0C until analysis. The UIE analysis was performed at BP Koirala Institute of Health Sciences (BPKIHS), Dharan.

2.6 Health education on iodine to pregnant mothers, women and Female Community Health Volunteers

Pregnant women were counseled and health education was provided regarding importance of iodine during pregnancy. We also assessed mother's knowledge on IDD. Health education was provided to pregnant mothers in the hospital.

In addition, we assessed the knowledge, attitude and practices of women in the community regarding iodine, iodized salt and iodine deficiencies. Health education was provided to women along with Female Community Health Volunteers (FCHVs) in the rural community of Myagdi. The health education was provided to 3 mothers group in the district. The mothers group of the dalit, janajati and disadvantaged community were included for health education package. In the meeting in the community, iodized salt packet with two children logo was distributed to motivate them to use iodized salt.

2.7 Data collection

Knowledge on iodine and IDD, perceptions of mothers on iodized salt was collected using questionnaire from mothers.

The descriptive qualitative information regarding the mother's perceptions on iodized salt were collected through interview and focus group discussion. Focus group discussion was conducted with women in the meeting.

2.8 Validity and reliability

Validity and reliability of the study was considered with high priority to minimize the respective errors. Standard techniques are being used for urine sample collection. Training and orientation for health workers were conducted as per need and sample are being collected under strict supervision of researcher.

2.9 Data management and analysis

Collected data were entered into SPSS version 13 and analyzed. Descriptive analysis was conducted. The following classification of urinary iodine excretion (UIE) for pregnant women was used.

Table 1: WHO classification of iodine deficiency disorders (IDD) on the basis of urinary iodine excretion for pregnant women

Median Urinary Iodine (µg/L)	Iodine intake	Iodine status
<150 µg/L	Insufficient	Severe iodine deficiency
150-249µg/L	Adequate	Adequate iodine nutrition
250–499 µg/L	Above requirements	Risk of iodine induced hyperthyroidism
≥500 µg/L	Excessive	Risk of adverse health consequences

Chapter-III

Findings

Data were collected using both qualitative and quantitative methods in Myagdi district. Qualitative data were collected from the community through focus group discussion. Quantitative data including urine samples were collected from pregnant women attending antenatal care check up clinic at Myagdi District Hospital, Beni.

3.1 Findings from qualitative methods

Altogether, 48 women were included in the focus group discussion and health education class. Among three FDGs, one group was from dalit community, one from upper caste and one from janajati. The finding of FGD is given below:

Heard of iodine deficiency disorder

Regarding the awareness about iodine deficiency disorder among the women involved in the focus group discussion and health education classes on iodine deficiency disorder, majority of the women were found aware of the iodine deficiency disorder. The mothers of Pipalbot ward no. 6 of Arthunge VDC (Brahman community) were found to be more aware about iodine deficiency as compared to women of ward no. 1 and 2 of Pulachaur VDC(Dalit community) and the women of Singa VDC ward no. 5 (Janajati community).

Symptoms or disease caused by iodine deficiency

Majority of the women were aware about the iodine deficiency disorder and they mentioned iodine deficiency disorders as heart disease, dizziness, handicap of hands and arms and deformities in hands and arms. Goiter, disability and mental retardation are the diseases of

iodine deficiency. The women of Singa mentioned that the use of iodized salt decreasing the rate of goiter in the children. Her son was found mentally retarded and she mentioned the importance of iodine as below:

"There was no iodized salt during the time I gave birth to my son, so my son became mentally retarded and I always tell my relatives to eat iodized salt."

Members of family suffering from goiter, stunted, disabled, mental retardation

No one was suffering from goiter, stunted, disabled and mental retardation from the family of women involved in the FGD and health education classes. But we found one of the family members of Singa VDC was mentally retarded and his mother (also involved in the FGD) mentioned the cause of his son to be mentally retarded due to lack of iodized salt previously.

Heard about iodine and iodized salt

Most of the women involved in the focus group discussion and health education classes were found aware of iodine. Regarding the sources of iodine majority of the mothers involved in the focus group discussion and health education classes mentioned iodized salt as a source of iodine. Majority of the women had heard of iodized salt from television, radio, FCHVs and health workers.

Photo 1: Conducting focus group discussion in Pulachaur VDC

Salt used for cooking

Regarding the use of salt for cooking all the women involved in the focus group discussion and health education classes mentioned that they use iodized salt with two child logo for

cooking. The mothers of Arthunge VDC mentioned that they were encouraged to use iodized salt from television, radio, FCHVs and health workers. All the mothers involved in the focus group discussion and health education classes mentioned that they use crystal salt for cattle.

Advantages of using iodized salt

The advantages of iodized salt mentioned by women of Pulachaur VDC were: do not give birth of disable and handicapped children and also gets vitamin. Similarly, the women of Arthunge of Pipalbot mentioned that iodized salt prevents from goiter and being handicap.
The women of Singa mentioned that:

"There was no iodized salt in previous years and there were more mentally retarded children but nowadays it is decreasing due to the use of iodized salt."

Storage of iodized salt at home

All the women involved in the focus group discussion and health education classes mentioned that they store iodized salt in the closed air tight container.

Benefits of using iodized salt by pregnant mother

Regarding the benefits of iodized salt for pregnant mothers, women of Pulachaur VDC mentioned that the health of pregnant mother becomes good and birth outcome of newborn will be better and in children it prevents from being disable, handicap and mentally retarded. Similarly, the women of Arthunge mentioned that lack of iodine during pregnancy can cause birth of children with low birth weight and mental retardation.

Awareness programme, training and others about iodine deficiency disorders

No one women involved in the focus group discussion and health education classes had attended awareness, training and other programs about iodine deficiency disorders. But some of the mothers were given health education on use of iodized salt during antenatal check up (ANC) visit.

Education on nutrition during ANC/PNC visit

Very few women involved in the focus group discussion and health education classes were provided nutrition education during ANC/PNC visit. During ANC visit they were provided iron for consumption upto 45 days after delivery. Very few women of Arthunge VDC mentioned that they were suggested to keep the iodized salt in the vegetable only after cooking. Regarding the use of salt for cooking the women of Pulchaur and Singa VDC, they keep salt while cooking, but the women of Arthunge VDC mentioned that they keep salt after cooking.

Frequency of consuming meat, milk products, fish and egg products

Regarding the consumption of meat, fish and eggs, majority of the mothers mentioned that they sometimes consume those foods. But they consume milk products sufficiently time to time.

Photo 2: Providing nutrition education to women

3.2 Findings from quantitative study

Demographic characteristics of women involved in the study

Most of the women included for UIE were less than 35 years old. The mean age of the women was 22.6 years (SD-4.7 years). Majority of women were literate including one third

with higher secondary and above education level. Majority of women were housewife (67.3 percent). Similarly, the occupation of husband included agriculture, daily labour and foreign employee. More than half of the women had first pregnancy. About 15 percent women had still birth in previous pregnancy.

Table 2: Demographic characteristics of the women

Characteristics	**Number**	**Percent**
Age distribution (in years)(n=97)		
< or equal to 20	33	34.0
21-35	63	64.9
More than 35	1	1.0
Mean age (S.D.)	22.6 (±4.7)	
Education level (n=98)		
Illiterate	9	9.2
Primary level	19	19.4
Secondary level	35	35.7
Higher secondary and above level	35	35.7
Occupation of women (n=98)		
Housewife	66	67.3
Agriculture	8	8.2
Business	4	4.1
Student	16	16.3
Government employee	4	4.1
Occupation of husband (n=98)		
Agriculture	28	28.6
Business	8	8.2
Daily labour	21	21.4
Government employee	10	10.2
Foreign employee	28	28.6
Student	3	3.1
Number of child (n=98)		
No child	51	52.0
One child	34	34.7
Two or more than two children	13	13.3
Still birth in previous pregnancy (n=98)		

Yes	15	15.3
No	83	84.7

Knowledge of iodine and IDD among pregnant women

Although two third of women had heard of iodine and iodized salt; hundred percent were using iodized salt in their households. The use of iron folic acids tablets during pregnancy was by 78.6 percent of women and 21.4 percent of women did not use which could be due to first trimester in first pregnancy.

Table 3: Iodine related information

Characteristics	**Number**	**Percent**
Hear about iodized salt		
Yes	71	72.4
No	27	27.6
Use of iodized salt in household		
Yes	98	100.0
No	-	-
Use of iron/folic acid tablets during pregnancy		
Yes	77	78.6
No	21	21.4

Urinary iodine level among pregnant women

Urinary iodine excretion (UIE) level indicates that one fifth of women had insufficient iodine intake. Similarly, 21.3 percent of women had UIE 150-249 µg/l.

Table 4: Urinary iodine excretion level and iodine intake status

UIE level (µg/l)	**Number (n=80)**	**Percent**
Insufficient (<150)	16	20.0
Adequate (150-249)	17	21.3
Above requirements (250-499)	47	58.8
Excessive (>500)	-	-

The cross-tabulation of urinary iodine excretion with different characteristics of women

revealed that age of women, education level, heard of iodized salt, use of iodized salt in the household and use of iron folic acid had no particular association with iodine intake status.

Table 5: Factors related to IDD

Characters	**Insufficient (<150)**	**Adequate (150-249)**	**Above requirements (250-499)**
Age (in years)			
Less than or equal to 20	8 (26.7)	6 (20.0)	16 (53.3)
21-35	7 (14.6)	11(22.9)	30 (62.5)
More than 35 years	0	0	1 (100.0)
Education level			
Illiterate	0 (0.0)	1 (12.5)	7 (87.5)
Primary level (1-7 class)	5 (31.3)	4 (25.0)	7 (43.8)
Secondary level (8-10 class)	6 (20.0)	6 (20.0)	18 (60.0)
Higher secondary and above level	5 (19.2)	6 (23.1)	15 (57.7)
Heard about iodized salt			
No	5 (22.7)	5 (22.7)	12 (54.5)
Yes	11 (19.3)	12 (21.1)	35 (43.7)
Use iodized salt			
No	-	-	-
Yes	16 (20.0)	17 (21.3)	47 (58.8)
Consume iron/folic acid			
No	3 (18.8)	2 (12.5)	11 (68.8)
Yes	13 (20.3)	15 (23.4)	36 (56.3)

Chapter-IV

Conclusion

Although the knowledge and practices of women on iodized salt was satisfactory, the urinary iodine excretion revealed that still one fifth of pregnant women had insufficient iodine intake. This indicates that the identified at risk population of IDD are still significant proportion in the population and these issues should be addressed by concerned government agencies and other stakeholders.

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Appendix-I

Focus Group Discussion (FGD) with Women

Name of the facilitators:

(1) Prof. Chitra Kumar Gurung
(2) Dr. Megha Raj Banjara
(3) Mr. Krishan Raj Pant
(4) Mr. Nav Raj Bist

VDC: Pulachaur **Ward No. :** 1 and 2

Participant women from dalit community

S.N.	Name of the women	Age (year)	Number of children
1.	Mrs. Sunmaya Nepali	45	2
2.	Mrs. Geeta Pariyar	18	1
3.	Mrs. Shanti Pariyar	17	Pregnant
4.	Mrs. Man Kumari Pariyar	65	3
5.	Mrs. Sermila Pariyar	22	1
6.	Mrs. Kamala Pariyar	20	2
7.	Mrs. Dalli Pariyar	43	4
8.	Mrs. Sarswati Pariyar	60	5
9.	Mrs. Durga Pariyar	40	4
10.	Mrs. Bisnu Pariyar	30	2
11.	Mrs. Geeta Pariyar	22	1
12.	Mrs. Suntali Pariyar	35	4
13.	Mrs. Tulsi Pariyar	20	2
14.	Mrs. Shanti Pariyar	28	4
15.	Mrs. Rupi Sara Pariyar	45	5
16.	Mrs. Sarada Pariyar	40	2
17.	Mrs. Santu Pariyar	19	1
18.	Mrs. Santoshi Pariyar	19	1
19.	Mrs. Kali Pariyar	45	4
20.	Mrs. Rupa Pariyar	22	2
21.	Mrs. Shanti Pariyar	23	2
22.	Mrs. Bina Pariyar	30	2

23.	Mrs. Tolken Pariyar	57	8
24.	Mrs. Tirth Pariyar	60	2
25.	Mrs. Gaumati Pariyar	60	3
26.	Mrs. Raj Kumari Pariyar	36	3

VDC: Arthunge **Ward No. :** 6

Participant women

S.N.	Name of the women	Age (year)	Number of children
1.	Mrs. Punamrupi Paudel	40	4
2.	Mrs. Rama Paudel	36	3
3.	Mrs. Shova Paudel	23	Unmarried
4.	Mrs. Manrupa Paudel	72	6
5.	Mrs. Jamuna Paudel	70	3
6.	Mrs. Parvati Paudel	33	3
7.	Mrs. Saru Paudel	24	2
8.	Mrs. Sarswati Paudel	27	2
9.	Mrs. Ganga Baniya	30	3
10.	Mrs. Pabitra Paudel	69	5
11.	Mrs. Sarswati Paudel	44	3
12.	Mrs. Sarita Paudel	27	2
13.	Mrs. Bhagwati Paudel	38	2
14.	Mrs. Santa Baniya	52	3
15.	Mrs. Santu Paudel	33	2

VDC: Singa **Ward No.:** 5

Participant women

S.N.	Name of the women	Age (year)	Number of children
1.	Mrs. Belmati Thapamagar	45	5
2.	Mrs. Shova Adhikari	30	3
3.	Mrs. Kopila Kishan	30	3
4.	Mrs. Ganga Kishan	28	3
5.	Mrs. Kamal Devi Shris	50	2
6.	Mrs. Laxmi Khatri	48	4
7.	Mrs. Manrupi KC	70	2

Appendix-II

Performa for collection of urine samples from baby

Date:

Newborn baby ID number:

Name of the mother:

Name of the father:

Address: District: VDC: Village:

Ward No.:

Name of the Hospital:

1. Age of the mother:
2. Caste:
3. Religion:
4. Weight of the baby:
5. General clinical status of the baby
    a. Normal
    b. Not normal
6. Urine sample collected
    a. Yes
    b. No

Performa for collection of urine samples from pregnant women

Date:

Name of the mother:

Name of the husband:

Address: District: VDC: Village:

Ward No.:

Name of the Hospital:

1. Age of the mother:
2. Caste:
3. Religion:
4. Weight:
5. General clinical status
    a. Normal
    b. Not normal
6. Urine sample collected in filter paper
    a. Yes
    b. No

Appendix-III

Information Sheet for Pregnant Women and Parents of Children

Name of Principle Investigator:
Name of Organization: Public Health and Infectious Disease Research Center (PHIDReC)
Name of Sponsor: Society for Eliminating Nepalese Iodine Deficiency Disorder (SENID) Japan

Information sheet for individuals participating in the research
"Screening of Iodine Deficiency Disorder (IDD) and Supplementation of Iodine among Pregnant Women in Beni Hospital, Myagdi, Nepal**"**

(I am ..... and I work at the PHIDReC Kathmandu. We are doing some research on the Iodine Deficiency Disorder to determine its burden in risk population such as pregnant women and children.)

Purpose of the research

Iodine Deficiency Disorder (IDD) is an important major micronutrient deficiency problem in Nepal. In areas with severe iodine deficiency (<50 mcg intake/day), goitrogenesis as well as hypothyroidism were frequently observed in mother and newborn as a result of the inability of the thyroid gland to adjust to changes in thyroid economy associated with pregnancy. Hence, the pregnant woman and the newborn have been considered primary targets for iodine supplementation in such areas.

All these findings associated with pregnant women justify the burning issue for the research on iodine deficiency disorders among pregnant mother and newborn. With these motivations, this pilot study has been designed to screen IDD in children born from iodine supplemented mothers during pregnancy and pregnant mothers testing TSH in order to implement iodine supplementation in pregnant women.

Procedures

The site of this study is Beni Hospital Myagdi. We will collect urine samples from 400 pregnant mothers when they seek ANC. We also assess knowledge and perceptions of mothers on IDD and iodine. The mothers will also be assessed clinically. Similarly, urine samples will also be collected from newborns from the same hospitals during the study period. Urine samples will be analyzed for urinary iodine excretion using standard procedure.

Risks and Discomforts

There will be no any risks during collection of urine sample. The urine sample will be collected using sterile leak proof container in the hospital when you seek ANC.

Benefits

Your participation is likely to help us to find out more about what is the burden of Iodine Deficiency Disorder (IDD) in high risk population in Nepal and this information will be useful to implement iodine deficiency control programme.

Incentives

You will not be provided any incentive to take part in the research.

Confidentiality

The information that we collect from this research will be kept confidential. Information about you that will be collected from the study will be stored in a file which will not have your name on it, but a number assigned to it. Which number belongs to which name will be kept under lock and key, and will not be divulged to anyone except the researchers, and research sponsors.

Right to refuse or withdraw

You do not have to take part in this research if you do not wish to do so, and this will not affect the future treatment of your family at the health facility at the District Hospital in any way. You will still have all the benefits that you would otherwise have.

You may stop participating in the research at any time that you wish to, without losing any of your rights as a patient or otherwise.

Who to contact

If you have any questions you may ask those now or later. If you wish to ask questions later, you may contact: (Prof. Chitra Kumar Gurung, PHIDReC, Kathmandu, Phone: +977-1-4494254).

Consent Form from Pregnant Women for Blood Sample Collection for IDD Screening

I have read/has been read to me the foregoing information. I have had the opportunity to ask questions about it and any questions I have asked have been answered to my satisfaction. I consent voluntarily to participate as a participant in this study and understand that I have the right to withdraw from the study at any time without in any way affecting me and my family as a health care seeker.

Participant's Name:
Signature:
Place:
Date:

Witness (Name):
Place:
Signature:
Date:

Certificate of Assent for Children for Collection of Urine Sample

I have read/has been read to me the foregoing information. I have had the opportunity to ask questions about it and any questions I asked have been answered to my satisfaction. I consent voluntarily for the participation of my child as a participant in this study and understand that I have the right to withdraw from the study at any time without in any way affecting me, my child and my family as a health care seeker.

Parent's/Guardian's Name:
Signature of Parent/Guardian:
Place:
Date:

Witness (Name):
Signature:
Place:
Date: