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Utilization of Antenatal Care

Highlights

Inflammatory Breast Cancer

Clinical Features and Outcome

Discovering Thoughts, Inventing Future

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Clinical Features and Outcome of Inflammatory Breast Cancer in Moroccan Population: Experience of Oncology Department of National Institute of Rabat

By Ouziane I MD, Bensouda Y MD, HM'rabti MD, Elomrani F MD, Elismaili N MD, Laanaz S MD, Elyacoubi H MD, Berrada N MD, Boutayeb S MD & Errihani H

National Institute of Oncology, Morocco

Abstract- *Background:* Inflammatory breast cancer (IBC) is a clinical condition characterized by varied incidence, geographical distribution, and poor prognosis. We conducted this study to trace his epidemiological and immunihistochemical, evolution.

Methods: Case files were collected from the archives of the National Institute of Oncology. Inclusion criteria included:

– Aproven histological diagnosis of breast cancer
– Skin erythema over at least one third of breast
– Symptoms appearing over a period of under six months

Results: We collected 172 cases, incidence was 5%.Erythema in more than one third of the breast, orange peel skin and edema was present in all patients.126 patients had a localized disease ,46 patients were metastatic.

Keywords: *inflammatory breast cancer, neoadjuvant chemotherapy, pathological complete response, moroccan, hormonal receptor, her2neu.*

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CLINICALFEATURESANDOUTCOMEOFINFLAMMATORYBREASTCANCERINMOROCCANPOPULATIONEXPERIENCEOFONCOLOGYDEPARTMENTOFNATIONALINSTITUTEOFRABAT

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Clinical Features and Outcome of Inflammatory Breast Cancer in Moroccan Population: Experience of Oncology Department of National Institute of Rabat

Ouziane I MD [α], Bensouda Y MD [σ], HM'rabti MD [ρ], Elomrani F MD [ω], Elismaili N MD [¥], Laanaz S MD [§], Elyacoubi H MD [χ], Berrada N MD [ν], Boutayeb S MD [Θ] & Errihani H [ζ]

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64% of patients with localized disease showed axillary lymph node activity, and 9,.3% supraclavicular adenopathy . The most common histological type was invasive ductal carcinoma, 95.6%. In 42.4%(n=59) of the cases, hormonal receptors were negative. Human epidermal growth factor 2 (HER2) status was positive in 59 %(n=52) of the cases. In 88% of the cases (n=109), anthracyclines were administered. Anthracyclines and taxane was delivered to 15 patients (12%).

Among 124 patients with local disease, 77.4% (n=96) were operated on. pCR (pathological complete response) was 4,8% (n=6).

Median overall survival (OS) in non metastatic patients was 16.5 months, three and five year's OS were respectively 11 % and 3%.

Conclusions: Our study confirms the higher incidence of IBC in Moroccan population comparatively to American and European populations. Positivity of HER2 was higher. Treatment used was insufficient, with poor survival. We have started a prospective registry of IBC in our institute.

Keywords: inflammatory breast cancer, neoadjuvant chemotherapy, pathological complete response, moroccan, hormonal receptor, her2neu.

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I. Background

Inflammatory breast cancer (IBC) is an uncommon form of breast cancer which represents the most aggressive manifestation of breast cancer, with a very poor prognosis. It has a particular geographical distribution with a higher incidence in North Africa-about 5-7% of all breast cancer cases [1].

At the National Institute of Oncology in Rabat, the first recruitment center in Morocco, we realized a retrospective study aimed at evaluating the incidence of this rare type of breast cancer in the country, tracing its immunhistochemical profile, and evaluating patient treatment and survival.

II. Methods

This is a retrospective study covering the period of January 2005 to December 2008, performed at the National institute of Oncology of Rabat.

We conducted our study based on clinical, histological and therapeutic data collected from the files of patients with inflammatory breast cancer available in the archives of the institute. Incomplete files were excluded.

Inclusion criteria of our study were: histological evidence of breast cancer and onset of inflammatory signs in less than 6 months. Twelve hundred sixty cases met our inclusion criteria.

Inclusion criteria of primary inflammatory breast carcinoma (IBC) include: a proven histological diagnosis of breast cancer, skin erythema in over one third of the breast, symptoms appearing over a period of less than six months.

All patients underwent chest radiography, abdominal ultrasound, and bone scans. The data collected from the patient's medical file included: age, time of onset of symptoms, clinical diagnosis, nodal involvement, stage, treatment received (chemotherapy, surgery, radiotherapy) and date of death or last visit.

Pathological complete response (pCR) was evaluated by Chevalier classification, which studied the response in both breast and lymph nodes: Grade 1 and

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2 correspond to obtaining a complete response; Grade 3 includes invasive carcinoma with tumor alterations; Grade 4 is defined by few alterations or absence of alterations of tumor cells.

a) Statistical methods

Data was analysed using SPSS 13 software. Overall survival and progression-free survival were estimated by the Kaplan-Meier method. A log-rank test was used to compare survival rates. The test was conducted at a 5% significance level. Descriptive statics with 95% confidence interval (CI) were calculated according to standard procedure.

III. Results

a) Patient characteristics

Between January 2005 and December 2008, out of the three thousand four hundred cases of cancer identified, one hundred seventy-two patients were identified as having inflammatory breast cancer; the incidence was 5%.

Patient age included in the study was 27 to 75 years (Figure 1), with a median of 46 years. The occurrence of inflammatory breast cancer was higher in patients between 40 and 49 years (n=68), 39, 5%. Non-menopausal women constituted 58% of the patients.

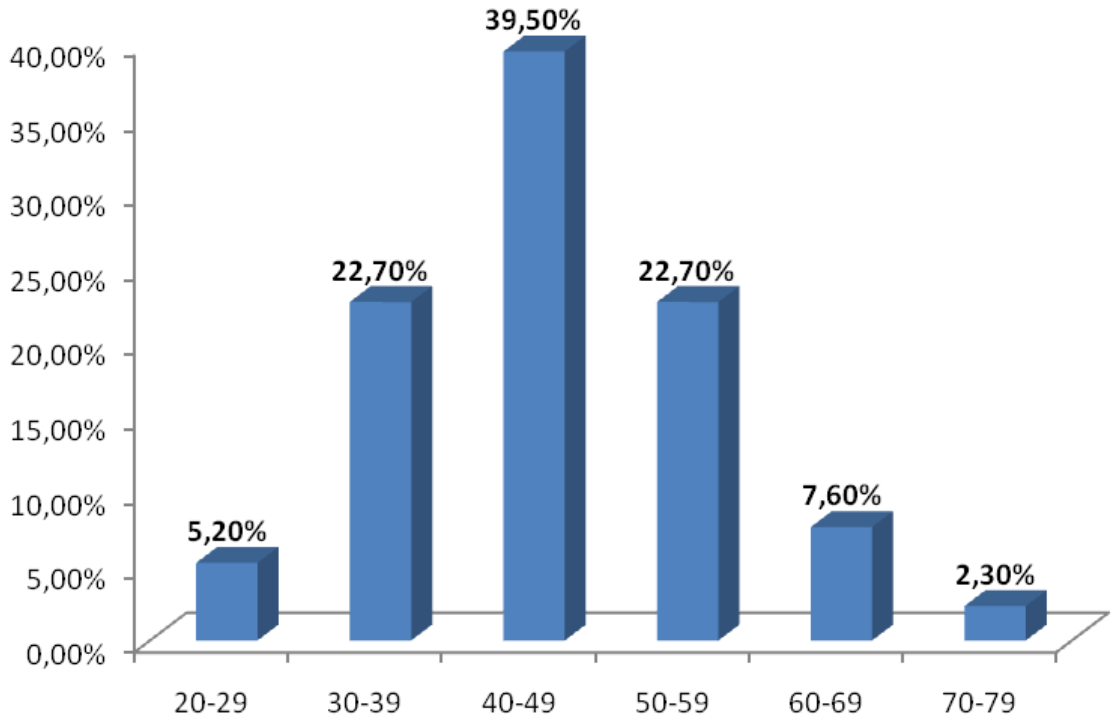


Figure 1 : Distribution of patients according to age

The time of the appearance of symptoms was less than six months in all patients, as defined in the inclusion criteria, to differentiate between a true inflammatory and locally advanced breast cancer. In half of the patients, the signs of inflammation appeared within three months.

b) Clinical features

Signs found in all patients upon clinical examination were: Erythema over more than one third of the breast, or orange peel skin, and edema. However, in 26.7% of the cases, no palpable mass was found.

Axillary lymphadenopathy was found in 64% (n=110), and the supraclavicular lymph node in 9.3% (n=16).

After staging, 27% (46) of the patients (n=46) had metastases at the onset. The metastasis site was: bone (n=32), liver (n=16), lung (n=17), and brain tissue (n=7). However, 39% (n=18) of the patients had multiple synchronous metastases (Table 1)

Table 1: The different metastasis site

Metastasis site	Number of patients
Bone	32 (69,5%)
Lung	17 (36,9%)
Liver	16 (34,7%)
Brain	7 (15,2%)
Multiple sites	18 (39%)

c) Histological and immunohistochemical features

The dominant histological type found was invasive ductal carcinoma (95.6%). Invasive lobular carcinoma was second, at only (3.4%), other histological types were found in 1% of cases.

94% of patients' tumors showed an aggressive profile, with grade SBR 2 and 3. Only 6 % of tumors were grade 1.

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Hormonal receptor status couldn't be determined in 19%. The criterion of hormonal receptor negativity was ER and PR negative, the rate of negative receptors was 42.4% (n=59).

Human epidermal growth factor 2 (HER2) status was positive in 59% of cases, but research of HER2 status was done on only 51% of all patients (n=88) (Table 2)

Table 2 : Clinicopathological characteristics of patients

Median age	46 years
Histological type	
Infiltrating ductal carcinoma	95,6% (n=161)
Invasive lobular carcinoma	3,4% (n=9)
Other	1% (n=2)

SBR grade	
I	6% (10)
II	54% (92)
III	40% (68)
Hormone receptors	
Negative	42,4% (59)
Positive	57,6% (80)
HER2	
Negative	41% (36)
Positive	59% (52)

d) Treatment

Among 126 patients with no metastatic disease, 2 patients couldn't receive chemotherapy because of an ECOG performans staus higher than 2.

Anthracyclines were administered in 88% of cases (n=109). The most commonly used protocol was the AC60 regimen (Anthracycline:60mg/m^2, cyclophosphamide:600mg/m^2) followed by the FEC 100 (5Fu:500 mg/m^2, Epirubicine:100mg/m^2, Cyclophosphamide: 500 mg/m). An association of sequential anthracyclines and taxane was administered to only 15 patients (12%). Patients received an average of 4 neoadjuvant cycles, with a minimum of 3 cycles and a maximum of 9.

Among 124 patients with localized disease we obtained 77.4% (n=96) of clinical response, a Patey was realized in all these patients. Some patients were inoperable, mainly due to the lack of response to neoadjuvant chemotherapy or clinical progression.

After surgery, an evaluation was made to the histological response in the breast based on the CHEVALIER classification, 8,8% (n=11) of our patients had a pathological complete response (pCR) in the breast. A lymphnodes complete histological response was found in 15,3% (n=19) of cases. pCR in both breast and nodes was obtained in 4,8% of cases (n=6).

Treatment of metastatic patients consisted on palliative chemotherapy .Protocols were heterogeneous, mainly anthracyclines in 80,6% of cases,10,8% (n=5) of cases received auther regimens (FUN,CMF)

8,6%(n=4) patients did not receive chemotherapy due to performans status higher than 2.

e) Follow-up

Patients were followed up for five years. Patients who were not reviewed in the last consultation were subsequently contacted by telephone. Monitoring was organized over several visits: every three months for two years, every 6 months for a year, then once a year.

f) Survival

Median overall survival (OS) for patients with localized disease was 16,5 months. Three and five year OS were respectively 11% and 3% (Figure 2).

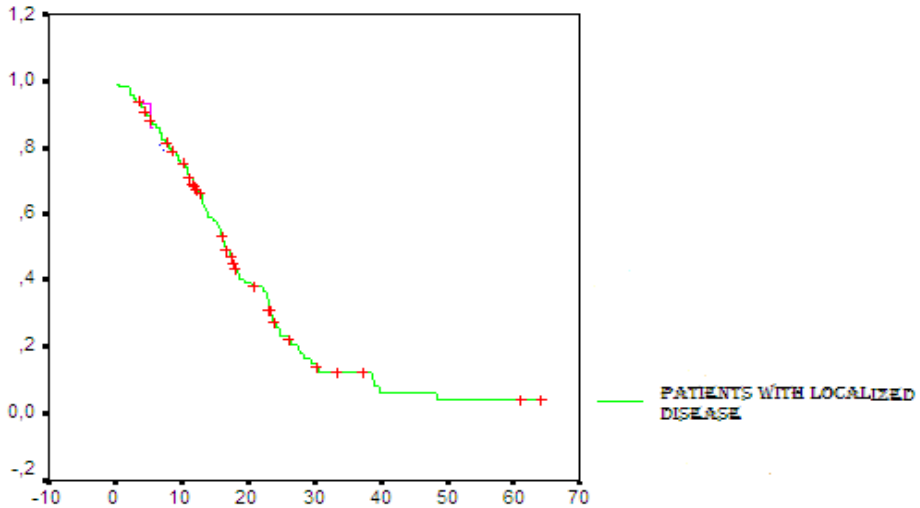


Figure 2 : OS in patients with localized disease

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During the follow-up, the evolution has been characterized by local recurrence in seventeen cases (27,5% of all patients). Metastasis occurred in 48 cases. The site of metastasis was lung in fourteen cases; the bone in eleven cases, liver in eight cases; lymph node and brain in eight and four patients respectively.

Metastatic patient survival was poor, with a median overall survival of 11.6 months. OS at 2 and three years was 1.5% and 0% respectively (Figure 3).

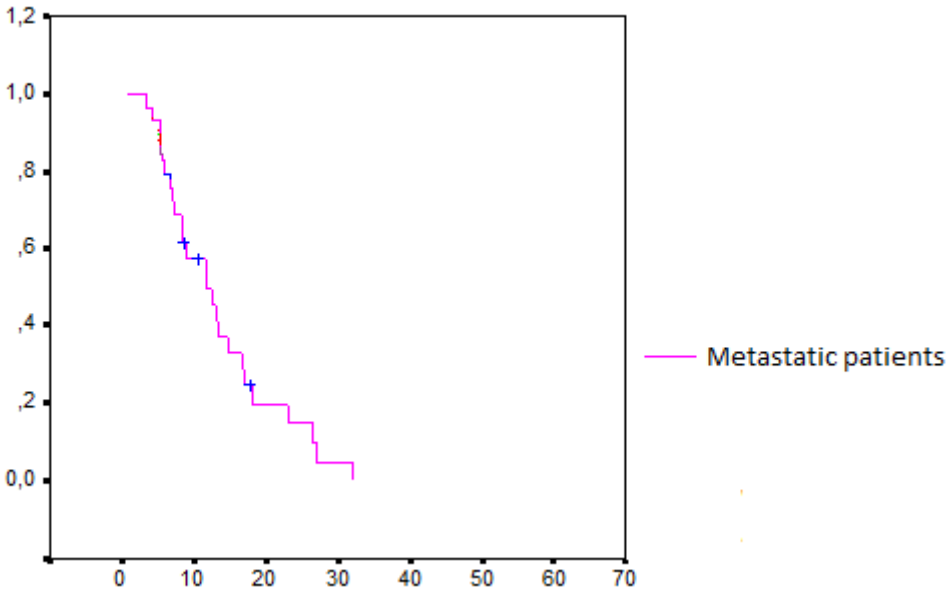


Figure 3 : OS in metastatic patients

Patient survival was influenced by the presence or not of metastases (p<0,0001) and hormonal status, patients with positive hormonal receptors had a better survival (p<0,002).

The difference in survival between patients with HER2 positive status and those with a negative HER2 was not statistically significant (p = 0.08), this is explained by the large number of patients (n=84) who have not benefited from the study of HER2 status.

IV. Discussion

Inflammatory breast cancer is now distinguished from other forms of locally advanced breast cancer. It is characterized by its clinical presentation and its severity. It accounts for about 1-7% of breast cancers with a frequency depending on the country (higher in the Maghreb countries including Tunisia). The current study represents a large retrospective review of 172 patients with a diagnosis of inflammatory breast cancer treated at our institute over four years (2005-2008). In our study, the incidence found was 5%. In the Tunisian study, Mourali, the incidence rises to 5.6% [2], which confirms the elevated frequency of this type of cancer in North African countries.. In the United States and Europe, IBC is particularly rare, its frequency not exceeding 3% in a wide study by the American SEER program (Surveillance Epidemiology and End Results), and 1% in Japan (Table 3) [3]

Table 3 : Incidence of IBC by country

OUR STUDY	5%
Japan	1%
USA(SEER)	1,9%
Spain	3%
ITALIE	3%
TUNIS	5,6%

Several medical teams have tried to identify risk factors related to this type of cancer; Tunisian studies have confirmed that the young age is a risk factor. Data from the SEER (Surveillance Epidemiology and end results program) show a higher incidence in the African-American race; this has been confirmed also by studying Chang-Shine (USA). Others factors are involved, such as the young age of first pregnancy, obesity. Mouse mammary tumor virus (MMTV) sequences have been reported to be present in some human breast cancers, recently, it has been shown that in addition to activation of cellular proto-oncogenes, MMTV can contribute to mammary tumorigenesis by direct transformation of normal human epithelial cells by expression of signaling proteins [4] [5].

Clinically, the diagnosis of inflammatory carcinoma is essentially based on an onset of

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symptoms within six months: Erythema over at least one third of the breast, edema, and warm breast, with or without an underlying palpable mass. Histological evidence of the presence of cancer is imperative [6]. All our patients saw their symptoms appear in less than 6 months.

The particularity of these neoplastic entities results not only in its clinical presentation, but also in terms of its bio molecular profile. Inflammatory carcinoma histology shows no specificity compared to other forms of cancer .The largely predominant histological type in the entire study is invasive ductal carcinoma, representing between 87% and 95%, the same result was found in our study with 89.5% (n=154) of invasive ductal carcinoma. But we must remember that there is no histological type specific to inflammatory breast cancer [7] .The real hallmark is the presence of dermal lymphatic invasion by lymphatic emboli. These emboli are responsible for the characteristics and clinical symptoms (color, edema), as well as high metastatic potential of breast cancer [6]. Skin biopsy remains important for the demonstration of emboli but not essential for confirmation of the diagnosis [8]

The molecular alterations usually reported in IBC include: Low expression levels of the hormone receptor, Paradiso and al, Boussen and al. Studies show more frequent negative estrogen and progesterone status in patients with inflammatory carcinoma than others [1][9]. Negativity of receptors is associated with poor survival rate [10]. In our study, we find 42.4 % of negative receptors, however, 19% of our patients have not benefited from the research of RH status.

Human epidermal growth factor receptor 2(HER2) is a proto-oncogene located in the long arm of chromosome 17 (17q21) and encodes a trans membrane receptor, tyrosine kinase. Its appearance is generally amplified in breast cancer. Furthermore, IBC has a higher percentage, thus reflecting its aggressive potential. Paradiso and al have used the results of 49 biopsies taken in patients with inflammatory breast cancer, 42% of these samples tested positive for HER2neu [9].The Tunisian Ben Hamida study supports these findings, objectifying the rate of HER2 amplification of 33.3% versus 14.5% in non-inflammatory cancers [11]. Our results are consistent with those findings, with 59 % of HER2 positivity detected (Table 4).

Table 4 : HER2 expression in the different series

study	Rate of expression of HER2
Chaher [12]	20%
Paradiso [9]	49%
Ben hamida [11]	33,3%
Our study	59%

Other characteristics of IBC tumors include a high expression of human epidermal growth factor receptor (EGFR), thus promoting increased transcription of cellular DNA [12][13]. There is also an over expression of a proto-oncogene p53-with a high mutation rate [14] E-cadherin is also over expressed, this molecule promote intercellular adhesion tumor, and the formation of tumor emboli infiltrating the lymphatic dermis [15][16].

Van Golen have identified the lack of a specific molecule IBC: WISP3 or LIBC (lost in inflammatory breast cancer), data indicate that LIBC/WISP3 acts as a tumor suppressor gene in breast [17]. Comparison of gene expression between human IBC and non-IBC tumor samples revealed overexpression of RhoC, which gives to IBC an invasive phenotype with a high metastatic potential [18].

In the MD Anderson study, 178 patients with inflammatory carcinoma were treated with primary chemotherapy centered on doxorubicin; patients subsequently received local treatment with radiotherapy or mastectomy followed by adjuvant chemotherapy. Overall survival rate within 5 years was 40%, with a median overall survival of 37 months. Histological responses to chemotherapy were obtained in 71% of cases, with 12% of pathological complete responses. 88% of our patients received only anthracyclines (AC60, FEC100), we obtained 66% of histological responses [19].

Nevertheless, integration of taxanes into combination chemotherapy has shown efficacy in neoadjuvant treatment. In retrospective analysis of M.Cristofanilli and al, with 240 patients included in 6 studies between 1973 and 2000, the addition of paclitaxel to anthracycline (FAC) increased the pCR rate by 15% (25% for FAC and paclitaxel versus 10% for FAC alone), progression-free survival and overall survival rate [20].

The largest study of patients with IBC who received Trastuzumab was reported from NOAH (neoadjuvant Trastuzumab) phase 3 trials. it included 343 HER2 positive patients, and it evaluated the benefits of adding Trastuzumab to neoadjuvant chemotherapy. Amongst the76 patients with HER2-positive IBC, a significantly higher pathological complete response rate (54.8%) was noted in women who received standard doxorubicin, paclitaxel, and cyclophosphamide chemotherapy with Trastuzumab than in women who received standard therapy without Trastuzumab (19.3%) [21]. In our study, no patient received Trastuzumab because it was unavailable until 2009.

Clinical complete response in the breast is defined by the absence of inflammation and clinical mass, with or without clinical complete response at the nodes [22].

Data from collected works reported a poor correlation between complete clinical response and histology. In a recent study on a group of 89 patients preoperatively treated with anthracyclines, 15 (17%) had a complete clinical response with only 3

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histopathological complete responses [23]. In our study, 77.4% of patients obtained clinical complete response, but complete histological response is noted in only 6 patients (4.8%). The study of Belembaogo and colleagues lead to similar gaps [24].

The study of Kuerer showed that pathological complete response obtained at the mammary gland or axillary lymph nodes is indicative of improved survival rate [25].

The prognosis of inflammatory breast cancer is unfavorable due to early metastatic spread and local recurrence. But a combination of chemotherapy, surgery, and radiotherapy has been a major breakthrough over the last three decades, As a result, survival rates have improved significantly, with 15-year survival rates of 20% to 30% reported [2][26] . In the Tunisian study of Boussen [1], the survival rate within 5 years was 8.52%, in our study it was 20%.

This is can be due to a suboptimal treatment neoadjuvant: only 12% of our patients received taxanes, and trastuzumab was not administered although 59% of patients were HER2 positive.

But it can also be due to the aggressive profile of inflammatory carcinoma in the Maghreb. SEER data support this hypothesis: a higher incidence of this type of cancer was observed in the African-American race [3]. Only an international multicenter observational study can answer to this probable difference in incidence and prognosis.

Two other features are added to the biological profile of inflammatory carcinoma: the angiogenesis and lymphogenesis. Mc Carthy and al. reported a significant increase in intratumoral microvessel density [27]. Indeed, Colpaert and al, showed intense angiogenesis by the percentage of high endothelial cells [16]. Based on this data BEVERLY sudy has evaluated efficacy and safety of neoadjuvant bevacizumab combined with trastuzumab and chemotherapy in patients with primary HER2-positive inflammatory breast cancer, 63,5% had a pathological complete response [28].

Recent data showed that the ALK gene is amplified in the IBC cell lines, in nine of the 12 patient tumors analyzed; However without detection of any activating mutations in the ALK gene, which are common in non–small-cell lung cancer [29].

V. Conclusion

Through our retrospective study, we have once again affirm that inflammatory breast cancer is a very aggressive tumor, with markers of poor prognosis, 59% of our patients expressing HER2, with a high rate of hormone receptor negativity whose mechanisms of action are still poorly understood, explaining his mediocre survival , 3% survival at 5 years.

A prospective study is underway the institute, to determine the contribution of targeted therapies in inflammatory carcinoma.

Abbreviations

IBC: inflammatory breast cancer

HER2: Human epidermal growth factor receptor 2

OS: overall survival

AC: adriamycine, cyclophosphamide

FEC: 5fluoro uracile, eprubicine, cyclophosphamide

FAC: 5fluoro uracile, adriamycine, cyclophosphamide

FUN: 5 fluoro uracile, navelbine

CMF: cyclophosphamide, metotrexate, 5 fluoruracile

SEER: Surveillance Epidemiology and End Results

pCR: pathological complete response

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

i.Ouziane: conceived of the study, participated in its design and coordination, contributed to the acquisition, analysis and interpretation of data and drafted the manuscript.

y.Bensouda: conceived of the study, participated in its design and coordination, contributed to the acquisition, analysis and interpretation of data and drafted the manuscript.

h.M'rabti: participated in the design and coordination of manuscript.

f.Elomrani: contributed to the acquisition and analysis of data.

n.Elismaili: conceived of the study, participated in its design and contributed to the acquisition of data.

S.Laanaz: contributed to the acquisition and analysis of data.

h. Elyacoubi: contributed to the acquisition and analysis of data.

N.Berrada: contributed to the acquisition and analysis of data.

S.Boutayeb: contributed to the interpretation of data.

h.Errihani: conceived of the study, participated in its design.

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Utilization of Antenatal Care Services and Influencing Factors among Women of Child Bearing Age in Assosa District, Benishangul Gumuz Regional State, West Ethiopia

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Abstract- *Background:* Every minute, somewhere in the world and most often in a developing country, a woman of reproductive age dies from complications related to pregnancy. The major reason for this huge magnitude of the problem is failure to use antenatal care services in developing countries. Little is known about the utilization and factors influencing the use of Antenatal care services.

Objective: To assess utilization of ANC services and influencing factors among women in Assosa District.

Methods: A community based cross sectional study design was conducted from May 17 – 31, 2012 on randomly selected samples of 536 women who had at least one delivery in the five years prior to the study. Structured questionnaire, FGD and in-depth interview guide were used to collect data. Data were analysed by using SPSS version 16.0. Binary logistic regression was used to determine the association between dependent and independent variables.

Keywords: *antenatal care, health service utilization, factors, assosa, benishangul gumuz.*

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Utilization of Antenatal Care Services and Influencing Factors among Women of Child Bearing Age in Assosa District, Benishangul Gumuz Regional State, West Ethiopia

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Abstract- Background: Every minute, somewhere in the world and most often in a developing country, a woman of reproductive age dies from complications related to pregnancy. The major reason for this huge magnitude of the problem is failure to use antenatal care services in developing countries. Little is known about the utilization and factors influencing the use of Antenatal care services.

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Results: Out of the 525 study subjects 430(81.9%) had at least one ANC visit. Factors influencing ANC service use were being able to read and write [AOR= 3.18, 95%CI: 1.15, 6.45], attending grade 7 and above [AOR= 7.6, 95%CI: 1.69, 34.34], availability of TTBA [AOR= 2.21, 95% CI: 1.19, 4.12], and distance of more than 30 minutes on foot [AOR= 0.25, 95% CI: 0.11, 0.58].

Conclusion and Recommendation: This study revealed that utilization of ANC services were relatively better, they are still low as compared to national HSDP IV target. . Educational status, availability of TTBA in the Kebeles, knowledge on ANC and distance of the services were identified as factors affecting ANC service utilization. Providing IEC and house-hold level discussion on the important of ANC service utilization in the district is recommended.

Keywords: antenatal care, health service utilization, factors, assosa, benishangul gumuz.

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I. Introduction

Antenatal care is one of the most effective health interventions for preventing maternal morbidity and mortality particularly in places where the general health status of the women is poor. The antenatal period presents an important opportunity for identifying threats to the mother and unborn baby's health, as well as for counselling on nutrition, birth preparedness, delivery care and family planning options after the birth (1, 2, 3).

A women's health is critical to her own life, and to the well-being of her family, and the economy of her community and her country (4, 5). But the mothers' health is closely tied to women's over all status. Where women lack education, economic opportunities and power over the decision that governs their lives, the health of the mother is poor. That is why world leaders gave a central place to maternal health and gender equality in the Millennium Development Goals. MDG 5, Improving Maternal Health, is often called "The heart of the MDGs," because if it fails, the other MDGs will fail as well (4, 5).

The health care that a mother receives during pregnancy is important for the survival and well-being of both the mother and the child. The importance areas to maternal health care service: antenatal care service; problems in accessing health care and awareness and attitudes concerning maternal health care service are also essential for the survival and well-being of both the mother and the child (4-7).

The World Health Organization (WHO) estimates that, every minute of every day, somewhere in the world and most often in a developing country, a woman of reproductive age dies from complications related to pregnancy (10, 11).

Now a day, the importance of Antenatal care services in reducing maternal mortality and morbidity has received a significant recognition. Implementing and assuring utilization of effective maternity care for women in the developing world is not an easy task. In Ethiopia, as in other developing countries, most childbearing women are poor and live under harsh conditions. For

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them, while adequate care during pregnancy is essential, health care service utilization is extremely low (7).

Ethiopia demographic health survey 2011results show that 34 percent of women received antenatal care from a trained health professional at least once for their last birth. This low utilization of health care services may give some indication of service coverage in the country. As a result, each year large number of women in the child bearing ages (15-49 years) were die from complications associated with pregnancy and childbirth (7, 8). In Benishagul Gumuz regional state, utilization of ANC was 35.1%. This figure indicates there was low utilization of antenatal care services. Even though, utilization of ANC services is affected by a multiple factors (7-9).

Therefore, an attempt was made in this study to assess the status of ANC service utilization and important factors that affect women's utilization of maternal health care services.

II. Methods and Materials

Community based cross sectional study design was conducted employing both quantitative and qualitative methods of data collections to assess the status of ANC services utilization and influencing factors among women in child bearing age in Assosa District, Assosa Zone, Benishangul Gumuz Regional state, North-west Ethiopia. The source populations were all women living in Assosa District and had at least one delivery in the five years period preceding the survey. For quantitative method: the study population were women selected from source population. For qualitative methods: the study population was the part of community members in the study area especially study kebeles site such as women in child bearing age group, community leaders, religious leader, husbands, health workers and health extension workers.

Sample size was calculated for the cross sectional quantitative study. However, the sample size was calculated for each factors and magnitude each component of maternal health services utilization and the optimum sample size was taken. The sample size was calculated using EPI table of EPI 6 computer software which used two population proportion formulas. Therefore, the highest sample size calculated place of resident factors on the institutional delivery and this research is the continuation of institutional delivery service utilization. So that the calculated sample sizes was 134 for urban and 402 for rural women to be selected considering a design effect of two for the variation due to clustering and non-response rate of 10%. The total calculated sample size was536 women. However, this sample size was calculated for the study done for institutional delivery service utilization which has highest sample size. For qualitative data, the sample size was purposively determined which result 29 key informative for in-depth interview and 10 FGD were selected to supplement the quantitative data.

Sampling technique for the quantitative data, multi-stage sampling technique was employed. First, the four urban and seventy four rural kebeles were listed from which a total of ten kebeles (1 urban and 9 rural) were selected using simple random sampling technique. Secondly, the numbers of households living in the area were recorded; the probability of being included in the sample was proportional to the total number of household residing in each kebele. Assuming every household was to host at least one woman who gave birth in the last five years, households were taken as a final sampling unit. Out of the one sampled urban kebeles, a total of 134 households were selected. Also from the nine sampled rural kebeles, a total of 402households were selected using simple random sampling techniques. For households that had more than one eligible woman, interview was done by selecting one of them using lottery method. Revisit of three times was made in case where eligible respondents were not available at the time of the survey before considering as non-respondent. Regarding a woman having two and more under five children the most recent birth was taken. For qualitative data, focus group discussions were conducted after selecting FGD participant purposively. A total of ten FGDs were conducted at each selected kebele (one FGD having 8 –12 individuals) and: 3FGD for women in child bearing age, 3FGD for husbands, 3FGD for religious and community leaders, and 1FGD for health workers. For in-depth interview purposively selected 29 key informants were interviewed from the ten selected kebeles. Ten health workers (one from each kebele), 9 HEWs (one from each of the rural kebeles having HEW) and 10 community leaders (one from each kebele) were interviewed. In order to minimize bias, those who participated in FGDs and in-depth interviews were excluded from participating in quantitative study.

Data collection instrument for Quantitative method: Structured questionnaire was prepared in English and translated to Amharic language and then back translated to English by different people and used in the data collection of quantitative survey. Amharic (the Official working language) was preferred. Whereas for Qualitative method: discussion guide was prepared in English and discussions were made in local languages. Tape record was used at the same time. Interview guide was prepared in English and used for in-depth interview of key informants. Both discussion guide and interview guide were not translated in to Amharic because they are moderated and collected by principal investigator and experienced nurse.

Ten female data collectors, who were health extension workers and could speak local languages like Bertegna, Afan-oromo and Amharic, were used. For

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supervision four nurses having Diploma were selected from Assosa District Health Office, Selga 22 Health Center and Abramo Health Centre. Both the interviewers and supervisors were given two days training before the actual work about the study. Practical exercise was made through peer interviewer. Pre-test was carried out on 27(5%) of the sample size in two of the kebele in Assosa district which were outside of the selected kebeles that has similar socio-demographics characteristic with the people in both urban and rural kebeles. After completing pre-test, discussion was made with supervisors and data collectors, and care was taken not to include the kebele where the pre-test was made. Then, the data were collected using house-to-house interview questions, which consist of seven parts. During the actual data collection, supervisors were assigned for the data collector. The supervisors checked the activities of each data collectors by walking with them in each kebele and sometimes-random spot-checking of the households were made to ensure reliability of the data collected. Each night the supervisors checked all the filled questionnaires for completion, clarity and proper identification of the respondents. Then, the principal investigator randomly checked 10% of the supervisors' work each day for completeness and relevance. Incomplete and unclear questionnaires were returned back to the interviewers to the next morning to get it corrected. For qualitative data: the principal investigator moderated the discussion of the male groups while the female groups were moderated by an experienced female nurse with diploma holder. Two senior nurses with diploma holder were took a note during the discussion. Each discussion had a tape recorded and finally the conversation was transcribed verbatim after each session and then analyze. Although, divers' opinions were expressed within each group, preliminary coding of transcript was done and themes that were directly related to the objective of this study were identified.

Data processing and analysis for quantitative method: the collected data were coded, entered and cleaned and analyzed by using SPSS Window version 16.0. Descriptive statistics was calculated for all variables. In bi-variate analysis crude odds ratio and confidence interval were determined to select candidate variables for multivariate analysis at the level significance ($p<0.05$). Binary and multivariate logistic regressions were used to determine the adjusted odds ratio and corresponding 95% confidence interval. A maximum likelihood estimate of the independent effect of the predictor variables was used to see the level of significance. The strength of association was interpreted using the adjusted odds ratio and 95% CI. The criterion for statistical significance was set at $p <0.05$. For qualitative method: Data of qualitative method were translated in to English, organized in narrative forms in congruent with the respondents' own words on the same day and analyzed by thematic frame work analysis.

Data quality was controlled by designing structured questionnaire. Interviewers were recruited and trained for two days. Pre-test was carried out for both tools. Two day training was given for data collectors, supervisors, and FGD moderators. The collected data was examined for completeness and internal consistency each day by supervisors. Strict supervision and tape recording of FGD process were also additional quality control methods

The study was conducted after approval of the proposal by ethical review committee of Jimma University. The survey was commenced after written consent obtained from Benishangul Gumuz Regional State Health Bureau to the respective offices. In turn the Assosa district Administration Office and Assosa Town Administrative Office wrote a letter to study kebeles to get permission and collaboration. Oral consent and written consent were obtained from each interviewee for their agreement to participate in the study. Interviews were conducted in private place. However, the women were assured that neither a 3rd party nor their husband will have access to their responses. Privacy, anonymity and confidentiality were maintained throughout the process of the study by avoiding identifiers such as name.

III. Results

a) Obstetric characteristics of respondents

Nearly two third (74.1%) of the respondents were married before the age of 20 years old; 79(60.3%) for urban and 310(78.7%) for the rural. Most 333(63.4%) women had their first pregnancy below twenty; 62(47.3%) were in urban and 271(68.8%) were in rural. Half (50.1%) of women were between gravidity two and five; 72 (55.0%) were in urban and 191 (48.5%) were in rural.

Half (50.3%) of the respondents whose birth order of the last delivery between two and five (72(55%) for urban and 192(48.7%) for rural). In contrast 166(31.6%) of respondents (8(6.1%) for urban and 158(40.1%) for rural) had their birth order of the last delivery greater than five. Regarding number of delivery within last five years 237(45.1%) women (85(64.9%) for urban and 152 (38.6%) for rural) had only one delivery while 236(45%) women (35(26.7%) for urban and 201(51%) for rural) had two deliveries. Majority of the women in rural area had two and more than two deliveries but most of the urban women had only one delivery within last five years.

Fifty nine (11.2%) women had history of abortion among these 47(79.7%) had one time. Ninety seven (18.5%) of the respondent had history of still birth. History of abortion and still birth were much higher in rural area than urban area. About one fifth (19%) of the

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respondents encountered at least one health problem during pregnancy of their last delivery. (Table – 1)

Table 1 : Obstetric characteristics of respondents in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012

Variables		Place of residence		Total (N=525)
		Urban (n=131)	Rural (n=131)	
		No (%)	No (%)	No (%)
Age at first marriage	<15	8(6.1%)	34(8.6%)	42(8%)
	15-19	79(60.3%)	310(78.7%)	389(74.1%)
	20-29	43(32.8%)	50(12.7%)	93(17.7%)
	>=30	1(0.8%)	0(0.0%)	1(0.2%)
Age at first pregnancy	<20	62(47.3%)	271(68.8%)	333(63.4%)
	>= 20	69(52.7%)	123(31.2%)	192(36.6%)
Gravidity	1	50(38.2%)	43(10.9%)	93(17.7%)
	2-5	72(55.0%)	191(48.5%)	263(50.1%)
	>5	9(6.9%)	160(40.6%)	169(32.2%)
Birth order of the last delivery	1	51(38.9%)	44(11.2%)	95(18.1%)
	2-5	72(55.0%)	192(48.7%)	264(50.3%)
	>5	8(6.1%)	158(40.1%)	166(31.6%)
No. of delivery in last 5 years	1	85(64.9%)	152(38.6%)	237(45.1%
	2	35(26.7%)	201(51.0%)	236(45.0%)
	>2	11(8.4%)	41(10.4%)	52(9.9%)
Ever had abortion	Yes	8(6.1%)	51(12.9%)	59(11.2%)
	No	123(93.9%)	343(87.1%)	468(88.8%)
Number of abortions ever encountered (n_1=8, n_2=51)	One time	8 (100.0%)	39 (76.5%)	47 (79.7%)
	>= two times	0 (0.0%)	12 (23.5%)	12 (20.4%)
Number of still birth (n1=9, n2=88)	1	9 (100.0%)	60 (68.2%)	69 (71.1%)
	2	0 (0.0%)	23 (26.1%)	23 (23.7%)
	>=3	0 (0.0%)	5 (5.6%)	5 (5.1%)
Any health related problems during last pregnancy	No	109 (83.2%)	316 (80.2%)	425 (81.0%)
	Yes	22 (16.8%)	78 (19.8%)	100 (19.0%)

Among women who encountered at least one health related problem during last pregnancy about 17(17%) encountered APH, 32(32%) severe headache, 37(37%) severe abdominal pain, 31(31%) drowsiness, 14(14%) persistent vomiting. These pregnancy related problems occurred more in rural than urban residents of the respondents. (Fig -1)

In the FGD of women in child bearing age; "The major cause of mortality and morbidity in the study areas were obstructed labour, prolonged labour, eclampsia (hypertension during pregnancy) and uterine rupture whereas the cause of morbidity were anaemia, malaria, persistent vomiting, bleeding during pregnant and after delivery".

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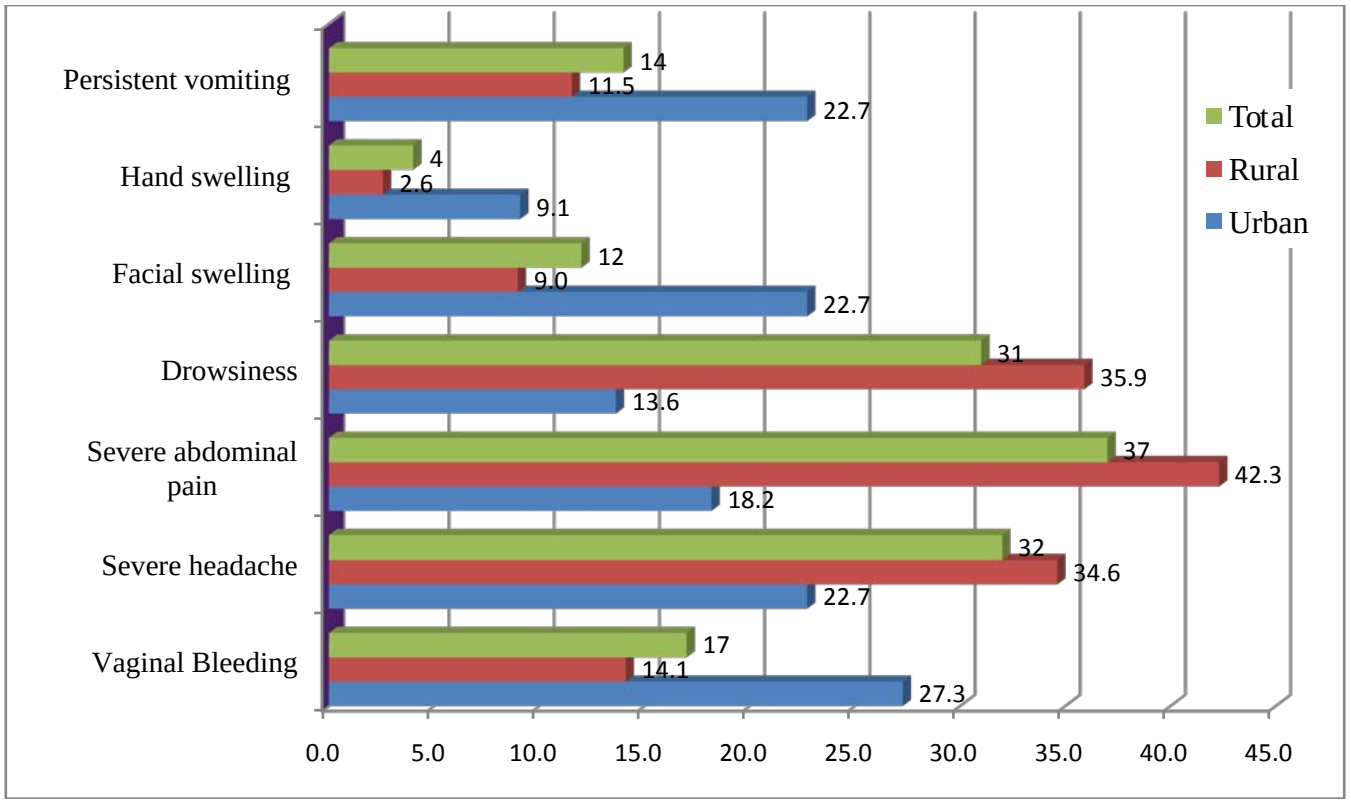


Figure 1 : Health related problems during last pregnancies in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012(n_1=22, n_2=78)

b) Utilization of Antenatal Care Service (ANC)

Four hundred thirty (81.9%) women who had birth within five year preceding the data collection period received ANC from health professionals during the last pregnancy (121(92.4%) for urban and 309(78.4%) for rural).

From those mothers who visited health institution for ANC, 94(77.7%) urban women and 122 (39.5%) rural women attended the care for at least four times during pregnancy. Out of 430 women who attended antenatal care 21(4.9%) women visited the care for one occasion only (1(1.7%) for urban and 19(6.1%) for rural). More than half (57.9%) women attended ANC at the time of second trimester (83(68.6%) for urban and 166(53.7%) for rural).

Among urban women who had ANC visit at least once, more than half 65(53.7%) of them visited hospital followed by 52(43%) health centre while among rural 68(22%) of them visited health center followed by 4(1.3%) hospital. More than half 183(59.2%) of rural women who had ANC visit at least once visited health post while 2(1.7%) urban women visited health post. Most ANC attendants 293(68.1%) were nurses followed by 108(25.1%) health extension workers. Among women who had ANC visit: 110(90.9%) urban respondents and 197(63.8%) rural respondents had information to deliver in the health facility. Majority 386(89.8%) of the respondents received TT vaccine and 91(21.2%) paid for ANC service (26(21.5%) for urban and 65(21%) for rural). Among respondents who paid for ANC service 14(15.4%), 58(63.7%) and 29(20.9%) rated paid Birr for the ANC service as expensive, fair and cheap, respectively. (Table 2)

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Table 2 : Information related to ANC visit of last pregnancy among respondents in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western Ethiopia, May 2012

Variables		Place of residence		Total (N=525)
		Urban (n=131) No (%)	Rural (394) No (%)	No (%)
Received ANC service	Yes	121(92.4%)	309(78.4%)	430(81.9%)
	No	10(7.6%)	85(21.6%)	95(8.1%)
Number of ANC visit	First visit	2(1.7%)	19(6.1%)	21(4.9%)
	Second visit	2(1.7%)	82(26.5%)	84(19.5%)
	Third visit	23(10.0%)	86(27.8%)	109(25.3%)
	Fourth visit	94(77.7%)	122(39.5%)	216(50.2%)
Time of first visit	First trimester	27(22.3%)	18(5.8%)	45(10.4%)
	Second trimester	83(68.6%)	166(53.7%)	249(57.9%)
	Third trimester	11(9.1%)	125(40.5%)	136(31.6%)
Place of ANC visit	Health Centre	52(43.0%)	68(22.0)	120(29.9%)
	Health post	2(1.7%)	183(59.2%)	185(43%)
	Clinic	2(1.7%)	54(17.5%)	56(13%)
	Hospital	65(53.7%)	4(1.3%)	69(16%)
ANC attendants	Doctors	17(14.0%)	9(2.9%)	26(6.0%)
	Nurse	102(84.3%	191(61.8%)	293(68.1%)
	Health extension	0(0.0%)	108(35%)	108(25.1%)
	TTBA	2(1.7%)	1(0.3%)	3(0.7%)
Information to deliver in health facility	Yes	110(90.9%)	197(63.8%)	307(71.4%)
	No	11(9.1%)	112(36.2%)	123(28.6%)
TT vaccine	Yes	106(87.6%)	280(90.6%)	386(89.8%)
	No	15(12.4%)	29(9.4%)	44(10.2%)
Did you pay for ANC service?	Yes	26(21.5%)	65(21%)	91(21.2%)
	No	95((78.5%)	244(79%)	339(78.8%)
How do you rate the payment?(n_1=26, n_2=65)	Expensive	2(3.8%)	12(18.5%)	14(15.4%)
	Fair	14(53.8%)	44(67.7%)	58(63.7)
	Cheap	10(38.4%)	9(13.8%)	19(20.9%)

c) Factors influencing utilization of ANC services

Bi-variate analyses involving all variables were performed to identify candidate variables for multivariate analysis with the utilization of ANC service. Consequently, place of residence, ethnicity, maternal education, religion, availability of TTBA, availability of health professional providing delivery service, knowledge on (ANC and delivery service), Attitude towards (ANC, delivery service, PNC and maternal health service),availability of delivery service, available of transportation service and distance of health facility showed significant association ($p<0.05$) with the utilization of ANC service.

A multivariate analysis was performed for identified candidate variables for utilization of ANC service in bi-variate analysis which showed significant association. So that ethnicity, educational status, availability of TTBA, knowledge on ANC and distance of health facility showed significant association on multivariate analysis. The odds of utilizing ANC among women who attended secondary school and above were 7.6 times more than women who were illiterate [AOR = 7.6, 95% CI: 1.69, 34.34] whereas women who were able to read and write were 3.18 times more likely to utilize ANC service than women who were illiterate [AOR = 3.18, 95% CI: 1.57, 6.45]. Similarly women for whom distance between home and facility took greater or equal to 30 minutes on foot were 75 percent less likely to use the ANC service than their counterparts [AOR = 0.25, 95% CI: 0.11, 0.58]. Regarding the availability of Traditional Trained Birth Attendant in the kebeles, women who reported existence of TTBAs in their kebele were 2.21 times more likely to utilize ANC

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services than women who reported absence of TTBAs [AOR = 2.21, 95% CI: 1.19, 4.12]. Women who were knowledgeable on ANC service were 1.96 times more likely to utilize ANC service than women who were not knowledgeable on ANC services [AOR = 1.96, 95%; CI:1.04-3.68]. **(Table-3)**

Table 3 : Factors influencing ANC service utilization in Assosa District, Assosa Zone, Benishangul Gumuz Region, Western- Ethiopia, May 2012

Variables		ANC service utilization		Crude OR (95%CI)	Adjusted OR(95%CI) *
		No	Yes		
Place of residence	Urban	10(7.6%)	121(92.4%)	1	
	Rural	85(21.6%)	309(78.4%)	**0.3(0.15-0.59**	0.27(0.06-1.18)
Religion	Orthodox	35(29.2%)	85(70.8%)	1	
	Muslim	58(14.9%)	330(85.1%)	**2.34(1.45-3.79)**	1.46(0.69-3.07)
	Others	2(11.8%)	15(88.2%)	3.09(0.67-14.22)	0.53(0.07-4.22)
Ethnicity	Berta	43(14.2%)	260(85.8%)	1	
	Amhara	44(27.8%)	114(72.2%)	**0.43(0.27-0.69)**	**0.28(0.13-0.62)**
	Oromo	2(5.1%)	37(94.9%)	3.06(0.19-1.37)	1.13(0.13-9.63)
	Others	6(24%)	19(76%)	0.52(0.19-1.37)	**0.08(0.02-0.39)**
Educational status	Illiterate	73(25.6%)	212(74.4%)	1	
	Able to read and write	14(11%)	113(89%)	**2.78(1.5-5.14)**	**3.18(1.57-6.45)**
	1-6th Grade	5(20.8%)	19(79.2%)	1.31(0.47-3.62)	1.92(0.55-6.71)
	>=7 Grade	3(3.4%)	86(96.6%)	**9.87(3.03-32.17)**	**7.6(1.69-34.34)**
Availability of TTBAs in kebele	No	36(20.9%)	136(79.1%)	1	
	Yes	59(16.7%)	294(83.3%)	**1.32(1.02-2.09)**	**2.21(1.19-4.12)**
Health professional provide delivery care	No	27(31%)	60(69%)	1	
	Yes	68(15.5%)	370(84.5%)	**2.45(1.45-4.13)**	1.29(0.71-2.38)
Knowledge on ANC service	Not-Knowledgeable	68(24.6%)	205(75.1%)	1	
	Knowledgeable	27(10.7%)	225(89.3%)	**2.71(1.7-4.49)**	**1.96(1.04-3.68)**
Knowledge on delivery service	Not-Knowledgeable	55(26.2%)	155(73.8%)	1	
	Knowledgeable	40(12.7%)	275(87.3%)	**2.44(1.55-3.83)**	1.55(0.8-3.0)
Attitude towards ANC service	Unfavourable attitude	17(33.3%)	34(66.7%)	1	
	Favourable attitude	78(16.5)	396(83.5%)	**2.54(1.35-4.77)**	1.95(0.79-4.78)
Attitude towards delivery service	Unfavourable attitude	34(26.2%)	96(73.6%)	1	
	Favourable attitude	61(15.4%)	334(84.6%)	**1.94(1.2-3.12)**	1.08(0.54-2.16)
Availability delivery service	Not available	27(31%)	60(69%)	1	
	Available	68(15.5%)	370(84.5%)	**2.45(1.45-2.09)**	0.93(0.45-1.91)
Transportation service	No	83(21.8%)	298(78.2%)	1	
	Yes	12(8.3%)	132(91.7%)	**3.06(1.62-5.8)**	1.8(0.58-5.62)
Time taken by the foot from home to health facility	< 30 minutes	81(16.8%)	401(83.2%)	1	
	>= 30 minutes	14(32.6%)	29(67.4%)	**0.42(0.21-0.83)**	**0.25(0.11-0.58)**

**** Adjusted for*** *place of residence, religion, ethnicity, educational status, available of TTBA, knowledge, attitude, availability of service, transportation service, availability of health profession providing delivery service and distance from home to health facility.*

Bold *indicates statistical significant at p. value = 0.05.*

IV. Discussion

Antenatal care is one of the most effective health interventions for preventing maternal morbidity and mortality particularly in places where the general health status of women is poor. This study revealed that utilization of ANC services was (81.9%) in the district. This result is almost consistent with most studies conducted in other parts of the country such as the result of study conducted in Harari region in 2006/7 (79.8%) and study done in Afar region in 2005 (80%) (14,16). However, this result is higher than the results of

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EDHS 2011 in Benishangul gumuz region (35.1%), study conducted in Yem Special woreda in 2008 (28.5%), in Harari region in 2009 (75%), EDHS 2011 in Somali region (21.5%), in Metekel zone in 2008 (49.8%) (8,15,17,18).This coverage could be due to the fact that ANC service is strongly given at the newly expanded growing health centres and health post through strong linkage with health extension and community health workers. Strong community mobilization is being done to avert complication during pregnancy and child birth and creating awareness of the community on importance of ANC services.

Utilization of ANC service in urban (92.4%) was higher than as compared to rural (78.4%). This is because of urban women had high awareness and knowledge on the important of ANC services.

Utilization of ANC service was more than 7.6 times higher among those who attended secondary school and above and among those literate were more than 3.18 times respectively compared to those who were illiterate. Furthermore, utilization of ANC services was 1.96 times higher among those who were knowledgeable on ANC service than mothers who were not knowledgeable on ANC services. This result in the line with other study done Sheka zone in 2008, study conducted in Special Yem woreda in2008 and in developing countries in including Ethiopia most women lack of knowledge on the risk of pregnancy and child birth, which influence the use of ANC service. Knowledge of women was also associated with their educational status which affects utilization of ANC service (17,20,21).Due to the possible explanation for why education is a key determinant could be that as a woman go up through the ladder of education, the more knowledgeable mothers will be use of ANC service.

Similarly women for whom distance between home and health facility took greater or equal to 30 minutes on foot were 75 percent times less likely to use the ANC service than their counterparts. This result was consistent with the study conducted in India, Pakistan, Kenya and Nigeria were find distance from health facility directly affected the attendance of women for ANC services (19,23,24,25). The possible explanation is that accessibility of health services have been shown to be an important determinant of utilization of maternal health care services in developing countries including Ethiopia (22). However, the result was lower than the study done in Yem special woreda women live in less than 60 minute walk from the health facility was 6.73 times more likely use ANC compare with live in far distance from the health facility (17).

Availability of traditional Trained Birth Attendant in the kebeles increase the odd of utilization of ANC service by 2.44 times higher among women with presence of TTBA in kebeles than with the absence of TTBA in the kebeles. This result consistent with WHO reports that is the trends have had serious implications on awareness, access and acceptability of maternal and newborn health services (13).This might be due to the TBAs have been trained by several development partners in modern methods of maternal health and childbirth to complement the existing maternal health services and improve their ability to refer.

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Knowledge and Practice of Mothers towards Exclusive Breastfeeding and its Associated Factors in Ambo Woreda West Shoa Zone Oromia Region, Ethiopia

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Abstract- *Back ground:* Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, improving maternal morbidity, and helping to control health care costs. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that every infant should be exclusively breastfed for the first six months of life, with breastfeeding continuing for up to two years of age or longer. The aim of this study to assess knowledge and practice of mothers and identify associated factors towards exclusive breastfeeding.

Methods: A community based cross-sectional study was employed. Sample size was determined by using single population proportion formula and four hundred three lactating mothers who have breastfed for 6 months and up to two years was selected by Simple random sampling technique. All explanatory variables that were associated with the outcome variable during bivariate analysis were included in the final logistic model. A multivariate logistic regression analysis was made to identify the predictors of maternal knowledge about exclusive breastfeeding practices.

Keywords: *exclusive breastfeeding, knowledge, practice.*

GJMR-E Classification : *NLMC Code: WS 125*



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Result: The mean duration of exclusive breast feeding among woman in the study subjects was 5.87 months with standard error of 0.025. The prevalence of exclusive breast feeding is 305(82.2%). Three hundred thirty seven (90.8%) of mothers were Knowledgeable. The actual practice of exclusive breast feeding was 305(82.2%). Among the total variables which were included in the analysis only three variables shows positive association with mothers EBF status. These are knowledge of EBF, ANC follow up and women occupation. House wife women were two times more likely exclusively breast feed their child comp aired to those employed (OR=2.42 CI=1.36, 4.33 P value = 0.022).

Conclusion and Recommendations: The study finding implies there is a gap between the current knowledge and actual practice of exclusive breast feeding in line with the WHO recommendations. Therefore, collaborative efforts have to be exerted at different levels, relevant stake holders, health providers together with the community to improve the situation.

Keywords: *exclusive breastfeeding, knowledge, practice.*

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I. Introduction

a) Back ground

Breastfeeding is the process of milk transference from mother to baby that is needed for the survival and health (1, 2). Breastfeeding Creates an inimitable psycho social bond between the mothers enhances modest cognitive development and it is the underpinning of the infant's well-being in the first year of life even into the second year of life with appropriate complementary foods from 6 months (3, 4).

Breastfeeding is an important public health strategy for improving infant and child morbidity and mortality, improving maternal morbidity, and helping to control health care costs. Breastfeeding is associated with a reduced risk of otitis media, gastroenteritis, respiratory illness, sudden infant death syndrome, necrotizing enter colitis, obesity, and hypertension (5). Nutrition deficiencies and infectious diseases are the leading causes of child mortality in developing countries. Breastfed infants have a reduced risk of malnutrition and common childhood infectious diseases. Maternal health benefits from breastfeeding have also been documented. To maximize the health effect of breastfeeding, optimum breastfeeding is recommended. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) recommend that every infant should be exclusively breastfed for the first six months of life, with breastfeeding continuing for up to two years of age or longer (6,7,8). Exclusive breastfeeding (EBF) is defined as feeding the infant only breast milk, with no supplemental liquids or solids except for liquid medicine and vitamin/mineral supplements (8).

For the first six months of life, infants should be exclusively breast fed to achieve optimal growth, development and health. Thereafter, infants should receive nutritionally adequate and safe complementary foods, while continuing to breast feed for up to two years or more. The single most effective Intervention to reduce child mortality in developed and developing countries is promotion of breast feeding practices.

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Despite this recommendation of worldwide only 39 % of infants 6 months of age are exclusive breast feed. In 2008 more than million children under the age of five die each year, 41 % of this death occur in sub-Saharan Africa and another 34% in south Asia and the major contributors to their death is poor breast feeding practice (9, 10).

Globally,60% of infant and young child deaths occur due to in appropriate infant feeding practices and infectious disease from which two third of these deaths are attributable to sub optimal breast feeding practices. Inappropriate infant feeding practice could have negative effect on child growth and development, especially in developing countries, where accessibility of basic health serves is not sufficient. (11)

In Ethiopia 57% of all under-five deaths is highly associated with abrupt cessation of breastfeeding and infectious diseases, but it is closely linked to gap of knowledge how to feed appropriately and food insecurity. A recent report showed that 27% of mothers early provide water, butter and various types of food to feed their children, thereby reducing the percentage of exclusively breastfeed and increasing the percentage of receiving complementary food at very young age. Generally, infant and young child feeding is a complex issue that has implications not only for an infant's nutritional and health status, but also affects infant's psychological development and the development of proper eating habits (11, 12,13).

b) Objectives

General objectives

- To assess knowledge and practice of mothers and identify associated factors towards exclusive breastfeeding.

Specific objectives

- To assess knowledge and practice of mothers towards exclusive breast feeding.
- To identify predictors of exclusive breast feeding.

II. Materials and Methods

a) Study setting and period

The study was carried out in Ambo woreda which is one of the eighteen woredas of West Shoa Zone. It is located 114 km from Addis Ababa. Based on the 2007 housing and census, population projection, it has an estimated total population of 129,094 of which about 65,094 are women. There are thirty two kebeles in the woreda. The weather condition of Ambo woreda is 35.3% high land, 50% woyna dega, 14.7% lowland. Data was collected from May to June 2014.

b) Study design and populations

A community based cross-sectional study design was employed. The study included lactating mothers who had Breastfed for not less than six months and up to two years and permanent resident of selected kebeles. Sample of mothers randomly selected from the source population was included in the study. The study included mothers who had children under 2 years and permanent resident of selected kebeles.

c) Sample size and sampling

First ten kebeles were selected randomly from total of 32 kebeles and complete census was conducted within the selected kebeles to identify the study subjects. Sampling technique was used to take the mothers-child pairs from each selected kebeles. The sample size was calculated using a formula for estimation of a single proportion as follows:

$n = (Z\alpha/2)^2 p (1-p) /d^2$

Where Z= Standard normal variable at 95% confidence level (1.96),

P= Estimated proportion of optimal breastfeeding, 50%, d= 0.05 (5% margin of error) and considering 5% possible non response rate.

The total sample size was 403.

d) Data Collection Procedure and Statistical Analysis

Interviewer administered questionnaire adapted from different literatures and modified according to the local context by the investigators was used to collect data concerning socio-demographics, maternal and child characteristics, child feeding practices. Furthermore, women's knowledge of optimal child feeding practices and socio-cultural influences of child feeding were also included in the questionnaire. Their knowledge and practice of breastfeeding were assessed from their responses. Questionnaire was prepared in English and translated to Oromiffa by language experts and then back translated to English language by a third person to check the consistency. Also to ensure the data quality it was collected by collectors who can speak the local language and training was given to them. The questionnaires were pre-tested. Based on a pretest result additional adjustment was made.

On site supervision was carried out during the whole period of data collection on daily basis. At the end of each day questionnaires were reviewed and cross checked for completeness, accuracy and consistency by the principal investigator and corrective measures were under taken.

The data was entered, coded, and analyzed using SPSS for windows version 21.0. Descriptive statistics such as mean was computed. The findings were presented with graphs and tables. Bivariate analysis was performed to identify the association of dependent and independent variables. Odds ratio was computed to see the strength of association between independent variables and exclusive breast feeding. To identify independent predictors, first a bivariate logistic regression was performed (at $p<0.25$) for each

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independents and outcome of interest. Finally a multivariate logistic regression analysis was made to identify the predictors of exclusive breast feeding practices. Variables which were significant on p-values of less than (0.05) were reported as predictors of exclusive breast feeding.

e) Ethical Consideration

The study was conducted after getting official permission from an ethical clearance committee of Ambo University, College of Medicine and Health Sciences. Data were collected after getting official permission from Ambo Woreda Administration. Letter of cooperation from kebeles administrators was also secured. Informed verbal consent was obtained from each study Participant before data was collected and each respondent was informed about the objective of the study and their right to with draw from the study. Confidentiality was secured.

III. Result

The total size of the study units who were actual respondents during the data collection period in this study was 371. Therefore, response rate for the interviews conducted was 92.05%. The mean age (+/-SE) of mothers in the study is found to be 26.5 years with standard error of 0.29. Most of the respondents, 345(93%), are married. Among the total respondents, 180(48.5%) are Orthodox. Oromo 293(79%) is the dominant ethnic group followed by Amhara 53(14.3%). The socio-demographic characteristics of the study population are listed in the Table 1.

Table 1 : Socio demographic characteristics of the respondents in Ambo woreda, 2014

Variables		Frequency	Percent (%)	Remark
Age group	15-19	27	7.3	
	20-24	122	32.9	
	25-29	152	41.0	
	30-34	26	7.0	
	35-39	30	8.1	
	40-44	12	3.2	
	45-49	2	0.5	
Marital status	Married	345	93.0%	
	Divorced	22	5.9%	
	Widowed	4	1.1%	
	Total	371	100%	
Religion	Muslim	30	8.1%	
	Orthodox	180	48.5%	
	Protestant	145	39.1%	
	Catholic	12	3.2%	
	Other	4	1.1%	
	Total	371	100%	
Ethnicity	Oromo	293	79.0%	
	Amahara	53	14.3%	
	Tigrie	11	3.0%	
	Others	14	3.8%	
	Total	371	100%	
Maternal education	Illiterate	62	16.7%	
	Able to read and write	16	4.3%	
	Elementary(1-6)	76	20.5%	
	Junior(7-8)	72	19.4%	
	Secondary(9-12)	92	24.8%	
	Tertiary(+12)	53	14.3%	
	Total	371	100%	
Husband education	Illiterate	20	5.4%	
	Able to read and write	10	2.7%	
	Elementary(1-6)	40	10.8%	
	Junior(7-8)	52	14%	
	Secondary(9-12)	99	26.7%	
	Tertiary(+12)	150	40.43%	
	Total	371	100.0%	
Occupation of the mother	Employee(GO/NGO)	61	16.4%	
	Merchant	68	18.3%	
	House wife	183	49.3%	
	Student	12	3.2%	
	Farmer	17	4.6%	

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	Daily worker	28	7.5%
	Other	2	0.5%
	Total	371	100%
Occupation of husband	Employee(GO/NGO)	168	45.2%
	Merchant	74	19.9%
	Student	9	2.4%
	Farmer	31	8.4%
	Daily worker	75	20.2%
	Other	14	3.8%
	Total	371	100.0%

a) *Knowledge and practices of respondents towards EBF*

The actual duration and feeding style about exclusive breast feeding among the respondents has assessed based on the WHO recommendations. Similarly, majority of the respondents 337(90.8%) know that the duration of EBF was 6 months without giving any additional food except necessary medications. Whereas, 10(2.6%) of respondents know that the duration of EBF was 4 to 5 months. The mean duration of EBF is 5.87 months with a standard error of 0.025 while, the median duration of exclusive breastfeeding is six months with a standard deviation of±0.48. The main Sources of information for mothers on EBF was television 126(34%) followed by others 107(28.8%) which include health workers and neighbors. Additionally, radio 40(10.8%) and magazine 5(0.2%) were the other source of information for mothers on EBF.

Three hundred forty eight (93.8%) of the respondents knew that, EBF is important for the child; to prevent young child from infection 78(21%), to strength the baby 55(14.8%), provide ideal source of nutrient 23(6.2%). Two hundred sixty three (70.9%) of mothers knew that breast milk is nutritionally enough for the first six month while, 48(12.9%) of them responded it is not enough and 41(11.1%) of them did not know whether it is enough or not.

Concerning the breastfeeding practices of the mothers, 305 (82.2 %) of the respondents practiced exclusive breastfeeding for the first six months whereas, 66 (17.8%) were not practiced EBF, due to the assumption of insufficient breast milk 30(8.1%), bottle feeding give enough food 14(3.8%), the baby was unable to feed breast 2(0.5%), breast feeding is pain full 2(0.5%). Breastfeeding initiation within one hour after birth was 264(71.2%), 93(25.1%) did so within twenty four hours after birth. On the frequency of breastfeeding 190 (51.2%) of the mothers fed their child 8-12 times per day, while 149(40.2%) of mothers fed their child less than 8 times per day, but the rest fed more than 12 times per day. Two hundred sixty four (71.2%), of mothers initiated breastfeeding within one hour after birth and 93(25.1%) of mothers did so within twenty four hours after birth. High percentage of the mothers 335(90.3%) were not practiced to give the child prelacteal food or fluid. However, 36(9.7%) of mothers practiced to give food or fluid before the initiation of breast feeding, predominantly butter 18(4.9%), followed by water 8(2.2%), others including glucose water 7(1.9%), cow milk 3(0.8%).The main reason of mothers to give prelacteal food for the new born is culture 16(4.3%), maternal illness 9(2.4%), painful breast 4(1.1%), caesarean delivery 7(1.9%).

Most of the respondents 212(57.1%) fed their child with bottle when they are away for long period of time, 70 (18.9%) gave expressed milk, 17(4.6%) gave care giver milk but 70(18.9%) did not go away. More than half of mothers192 (51.8%) fed their baby on demand and 35(9.4%) fed when they are free to feed while 141(38.0%) fed when the baby cry.

Table 2 : knowledge and pattern of breast feeding in Ambo woreda 2014

Variables	Frequency (n)	Percent (%)
Knowledge of EBF		
Yes	337	90.8%
No	34	9.2%
Exclusively breast feed		
Yes	305	82.2%
No	66	17.8%
Breastfeeding initiation		
Within one hour	264	71.2%
After one hour	93	25.1%
Breast feeding frequency		
<8	149	40.2%
8-12	190	51.2%
>12	32	8.6%

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Prelactal food		
Yes	36	9.7%
No	335	90.3%
Types of prelactal food		
Butter	18	4.9%
Water	8	2.2%
Cow milk	3	0.8%
Glucose water	7	1.9%

Finally those variables which show significant associations in bivariate analysis candidated to multivariate analysis. Accordingly results showed that three variables had significantly associated with mothers EBF status. Those who had knowledge on exclusive breastfeeding were 2 times more likely to breastfeed exclusively than the ones who had no knowledge on exclusive breastfeeding (Adjusted OR = 2.02, 95% CI= 1.12, 4.48). Also those mothers who had ANC follow up were 4.37 times more likely to exclusively breastfeed their infants than those in the referent group (Adjusted OR = 4.37 95% CI= 2.19, 10.45). The results are summarized in table 3

Table 3 : Determinant factors of exclusive breast feeding status in Ambo Woreda 2014

Variables	No	COR	AOR	P-value
Religion				
Muslim	30	0.48 (0.53,10.44)	0.24(0.16, 11.44)	
Orthodox	180	1	1	
Protestant	145	0.95(0.68,1.32)	0.92(0.68, 3.27)	
Catholic	12	2.68(1.32, 22.49)	0.39(0.20, 18.75)	0.112
Other	4	0.61(0.13, 1.44)	2.33(0.15, 5.65)	
Ethnicity				
Oromo	293	1	1	
Amahara	53	1.20 (0.46, 3.25)	1.40 (0.38, 5.23)	
Tigrie	11	0.92 (0.23, 23.93)	1.08 (0.23, 15.14)	
Others	14	2.31 (0.18, 32.31)	1.18 (0.32, 21.40)	
Mothers education				
Illiterate	62	1	1	
Able to read and write	16	2.50(0.73, 10.42)	3.50(0.63, 5.58)	
Elementary(1-6)	76	1.24(0.14, 6.47)	4.12(0.17, 17.54)	
Junior(7-8)	72	3.53(0.06, 37.02)	1.50(0.08, 15.16)	
Secondary(9-12)	92	0.15(0.01, 0.63)	4.50(0.38, 6.66)	0.0821
Tertiary(+12)	53	1.10(0.14, 4.32)	0.09(0.25, 7.03)	
Husband education				
Illiterate	20	1	1	
Able to read and write	10	3 (0.17, 13.32)	0.03(0.66, 2.65)	
Elementary(1-6)	40	0.61 (0.29, 1.28)	1.54 (0.74, 3.22)	
Junior(7-8)	52	0.71 (0.33, 1.13)	1.53 (0.83, 2.81)	
Secondary(9-12)	99	0.92 (0.42, 1.99)	1.11 (0.52, 2.39)	
Tertiary(+12)	150	0.53 (0.29, 0.96)*	1.44 (0.93, 2.25)	0.132
Mother Occupation				
Employee(GO/NGO)	61	1	1	
Merchant	68	4.21(0.57, 1.44)	0.64(0.55, 2.85)	
House wife	183	0.53(0.46,0.82)	2.42(1.36, 4.33)	0.022
Student	12	0.92(0.67,1.27)	0.95(0.68,1.32)	
Farmer	17	0.10,(0.00,0.70)	0.45(0.38,1.89)	
Daily worker	28	0.81 (0.52,1.27)	0.51 (0.22,1.23)	
Other	2	0.31 (0.11,1.51)	0.13(0.28,1.11)	
Husband occupation				
Employee(GO/NGO)	168	1	1	

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Merchant	74	0.64 (0.14, 2.42)	0.62 (0.19, 1.98)	
Student	9	0.95(0.68,53.32)	0.92(0.68, 43.27)	
Farmer	31	0.46 (0.09, 2.03)	0.44 (0.13, 1.49)	
Daily worker	75	0.25 (0.04, 1.47)	0.54 (0.15, 2.03)	
Other	14	2.06 (0.94, 14.81)	0.69 (0.12, 15.07)	
ANC follow up				
Yes	317	6.16(2.33, 11.56)	4.37(2.19, 10.45)	0.012
No	54	1	1	
Place of delivery				
Home	25	1	1	
Health facility	346	2.68(1.32, 22.49)	0.39(0.20, 1.75)	0.105
Mode of delivery				
Normal (SVD)	340	1	1	
Caesarian section	31	0.61(2.13, 1.44)	2.33(0.15, 5.65)	0.071
Knowledge on EBF				
Yes	337	2.08(1.13, 3.34)	2.02 (1.12, 4.48)	0.003
No	34	1	1	

IV. Discussion

The median duration of exclusive breastfeeding in Ethiopia was documented with a wide range of variety from lowest (0.4 month for Afar Region) through the highest (4.3 months for Amhara region) (14,15). However in this study, the median duration of exclusive breastfeeding is six months which is in line with WHO recommendation.

According to our study maternal knowledge about exclusive breast feeding, ANC follow up and women occupational status are the three variables which had significant effect to practice EBF. This study revealed high percent of women have knowledge about exclusive breast feeding 337(90.8%) and also maternal knowledge about exclusive breast feeding has significantly associated with their practice. This shows similarity with the study conducted in Arba Minch woreda zuria in which Breastfeeding is considered as a natural gift in according to their in depth interview showed some mothers perceived breastfeeding as a natural gift though they could not feed appropriately due to field and home activities. EBF practice was more common among knowledgeable mothers. This shows that basic education in the promotion of EBF should be encouraged. This is fully supported by the study conducted at Arba Minch zuria in which findings from in-depth interviews indicated mothers' knowledge of optimal breastfeeding is due to an exposure to health education given by health extension workers. This study indicated health education which is given at different occasion concerning about hygiene, complementary food and breastfeeding practices is one of the predetermining factors to promote optimal breastfeeding practices (16). The prevalence of exclusive breastfeeding practice was 305(82.2%). This is higher than the findings of Arba Minch woreda zuria (55.6%), semi urban community of Nigerian mothers (69.5%) and that of rural Papua New Guinea (17%).(16-18).

According to result of this finding women's who had ANC follow up during their pregnancy period four times more likely to practice EBF compared to those did not have follow up. This might be due to fact that counseling about EBF and its importance after the birth of the child is provided for women's during their ANC follow up.

Other major finding in this study is that women's occupation. Being house wife shows positive association with women's EBF status compared to that of employed. The likely explanation for this association could be this types of mother's have more chance to be with their child all the day so that they can provide their breast milk to their child as per needed. In other side when we observe the employed ones they are away of their child due to their job.

From our study 66(17.8%) of mothers were not practiced EBF, due to the assumption of insufficient breast milk 30(8.1%), bottle feeding give enough food 14(3.8%), the baby was unable to feed breast 2(0.5%), breast feeding is pain full 2(0.5%). The reason of those mothers is inconsistent with mothers in south west Nigeria, who were not practiced exclusive breast feeding (81%) with the perception that babies continued to be hungry after breast feeding (29%), maternal health problems (26%), fear of babies becoming addicted to breast milk (26%), and the need to return to work (24%) (19).

V. Conclusion

In summary, even though majority, 337(90.8%) of the respondents are knowledgeable about EBF but, still there is a gap between the actual practice within the recommended duration and feeding style which is 305(82.2%). Women's knowledge about EBF, ANC follow up and occupations are the important variables which show positive association with their practice.

Based on the finding of this study, health service organizations have to critically look at the gap between the actual exclusive breast feeding and the

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practice done in the area and have to orient service providers at service delivery points, particularly in clinic based settings on exclusive breast feeding practice. programs made to improve maternal and child health should consider the above modifiable factors like enhancing maternal knowledge of exclusive breast feeding and giving health education about the advantages of ANC service and then women's have utilize the service. Policy makers should consider the barriers of women's occupation for EBF during the first six months of child life.

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Conflict of interest: None declared

Ethical approval: Approval and permission was sought from Ethical Review Board of College of Medicine and Health Sciences of Ambo University

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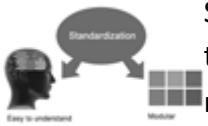


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3. Submission of Manuscripts,

4. Manuscript's Category,

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Content

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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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