CHAPTER 5
DISCUSSION

5.1 INTRODUCTION

Reproductive Tract Infections (RTIs), which include sexually transmitted infections (STIs), threaten health both directly and, in predisposing to HIV infection, also indirectly. In fact, the identification of RTI/STI as a silent worldwide pandemic which is a risk factor for the spread of HIV infection has contributed to a large extent to the global awareness of RTIs/STIs\textsuperscript{27}. The incidence is relatively high in women of the age group 15-49 years\textsuperscript{11}.

Women tend to suffer more because of the synergistic effects of chronic diseases with high rates of complications, malnutrition and unregulated reproduction. Also it must be mentioned that women suffer more from RTI/STI and its complications due to their stigma, embarrassment, their subordinate social status and the cost of treatment. On the other hand, many women believe that the symptoms of RTI/STI – discharge and pain-are simply “women’s fate” and therefore, their reproductive tract infections remain as a hidden and unspoken health problem. In these circumstances if a woman – especially in developing countries – suffers from a chronic disease - like RA - which usually includes a huge cost for treatment, she will be more reluctant for treatment of her RTI/STI and follow-up. This can lead to more severe RTI and even fatal complications of RTI/STI for women.

The most serious long-term complications and sequel that arise in women are pelvic inflammatory disease (PID), infertility, chronic pelvic pain, ectopic pregnancy and cervical cancer. Untreated RTI/STI in pregnant women can lead to spontaneous abortion, still birth, low birth weight, gonococcal eye infections and congenital syphilis in newborns. The presence of an RTI/STI increases the risk of acquiring and transmitting HIV infection by 3-10 times. RTI/STI also causes discomfort and lost economic productivity\textsuperscript{3}.

A number of studies have shown that many Indian women suffer from RTIs. Women in India often bear the symptoms of RTIs silently without seeking health
RTIs and their sequels are an important component of programs for family planning, child survival, women’s health, safe motherhood, and HIV prevention. RTIs have profound implications for the success of each of these initiatives, and conversely these initiatives provide a critical opportunity for the prevention and control of RTIs. The Government of India recognized the importance of RTIs and STIs in undermining the health and welfare of individuals and couples in a policy statement on the Reproductive and Child health Program (RCH).

Women are biologically more susceptible than men to some chronic disease such as Rheumatoid Arthritis (RA) and are also vulnerable to RTI/STI. However, information about RTI/STI; its consequences and risk factors among women who suffer from RA is limited. There are a lot of unanswered (or unasked) questions that whether RTI is prevalent among women with chronic disease or chronic disease can affect morbidity of RTI due to the nature of disease and its complications, its medicines and their side effects or also because of disability of chronic disease. So there is a need to collect data on the prevalence of RTIs among women suffering different chronic disease. Since RA is a chronic disease and women are affected three times more often than men, it was selected in this research. The prevalence of RA in the Pune region - India is reported to be 0.28 (rural population) and 0.55 (urban population).

Rheumatoid Arthritis is a chronic disabling and deforming inflammatory polyarthritis with symptoms of synovitis, fatigue, anorexia, weakness, weight loss, depression, and vague musculoskeletal symptoms. It is an autoimmune disease. The hands, wrists, knees, and feet are commonly involved. Pain, aggravated by movement, is accompanied by swelling and tenderness. Extra-articular manifestations include rheumatoid nodules, vasculitis, cardiac and pleural-pulmonary symptoms. RA is a chronic disease that leads to joint damage within the first 2 years; causes marked functional limitation and a 30% loss of work within the first 2-5 years, and shortens life by 5 to 7 years. Numerous studies have demonstrated increased mortality in patients with RA compared with the general population. There are reports of increased risk of death from gastrointestinal, cardiovascular, respiratory, hematological, and infections disease. RA is characterized by progressive disability overtime. Significant disability occurs early in the courses of the disease.
There are some studies which show improvement of RA during pregnancy and conversely, postpartum and miscarriage are associated with accelerated joint destruction\textsuperscript{114}. Also there are sparse studies about RA and sexuality\textsuperscript{25, 26}. But there is no study on whether RA as a long life disability disease which has an immunosuppressive nature with a lot of complications – such as pain, disability, and immobility, immunosuppressive drugs, extra-articular manifestations, and fatigue, social and economical consequences of chronic disease -has any effect as risk factors for RTI. Determining the prevalence rates of RTI among women suffering chronic disease like RA is a vital indicator of reproductive health among them. The results of this study can been categorized and discussed as follows.

5.1.1 General demographic, socio–economic features, hygienic information, in the study subjects

Total sample size contained 400 married RA women (15-49 year’s age) 46.5% of them were in age group of 41-49 years and 11.3% were in age group of 15-30 years. COPCORD Bhigwan (Pune- India) data revealed a surprisingly high prevalence of RA in young women which has not been reported in other population based studies from rest of the world\textsuperscript{115, 108}. Prevalence of RA per 100,000 populations was 1639 among women 30-44 years and 1775 among 45-59 years women in Bhigwan\textsuperscript{115, 108}. Our finding is in line with the above study. In this study 83.0% of sample population was Hindu and 12.3% Muslim, 4.8% were of other religion (Jain, Sikh, Buddhist, and Zoroastrian).

Among all 400 married RA women 11 women were widowed and 3 women were divorced and 2.3% of RA women in this study had married more than one time. Also 10.3% of RA women were illiterate (inability to read or write), 12.5% were educated less than 5\textsuperscript{th} standard (school education), and 50.7% completed school among 5\textsuperscript{th} to 12\textsuperscript{th} and 20.3% were educated above higher secondary, 5.2%, 53.4% and 37% husbands of RA women in the study were illiterate, educated up to 5-12\textsuperscript{th} standard and educated beyond 12\textsuperscript{th} standard respectively.

Fifty RA women (12.5\%) of this study were employed; 16.0% among this group worked for 8 hours, 78.0\% for less than 8 hours and 6\% for more than 8 hours
daily. Among employed RA women, 74.0% did not have any problem with toilet in their work place while 26.0% reported major problem (absent or much difficulty in the toilet facility at their work place). Out of 50 employed RA women 92.0% had toilet with water in their work place but 8.0% did not have water facility in the toilet of their work place.

While 29.8% of RA women were living in rural areas but 70.3% of them were in urban areas. 85.8% had ownership houses, 87.3% had piped water, 94.8% had bathroom and 87.5% had toilet in their residence. Since the majority of RA women in this study were living in urban areas, the piped water, bathroom and toilet were available for them. 50.3% of RA women in this study were living in houses with 1-2 rooms and 32.5% were with joint family.

54% of RA women had age of menarche above 13 years. According to a study on age at menarche among Indian (Maharashtraian) girls, 63.30% of girls had menarche age 12-13 years and 11.74% had late menarche (after 14 years)\textsuperscript{116}. Since RA is associated with delayed menarche age\textsuperscript{117}, a high percentage (54%) of late age menarche was reported in this study. 54% of RA women presented in this study used improper linen for menstruation bleeding. 59.8% of women reported age of marriage in the range of 16-20 years. 61.3% of RA women reported 1-4 times coitus per month and only 4.8% had intercourse during menstruation period. 28.8% of RA women had pregnancy twice, 4.5% did not have any pregnancy and 0.8% of them were pregnant 7 times. 40.5% of RA women had 2 live births outcome and 1% had 6 live births outcome. Also 1.8% of RA women had 2 still births and 97.3 % did not have any still births outcome. 20% of RA women had induced abortion and 18.8% of women had spontaneous abortion. In the current study, 3.3% of RA women had infertility. 48.3% of RA women in this study had undergone sterilization as contraceptive method. Also 7.5% of women in this study had history of hysterectomy.
5.1.2 Clinical features of RA disease, HAQ and QOL scores in the study subjects

In this study 38% of RA women had early RA (duration of disease ≤ 2 years). And 83.5% of RA women did not have any disease except RA but 1.5% reported a history of diabetes, 8.0% UTI, 0.8% jaundice, 0.8% TB, 2.0% hypertension, 2.0% hypothyroid, 0.5% hyperthyroid, 0.3% kidney stone and 0.8% Chikungunya viral illness. There have been a number of studies looking at co-morbidities that have an increased frequency in RA. The most widely investigated has been the occurrence of other autoimmune diseases, particularly type 1 or insulin-dependent and autoimmune thyroid disease.

The functional limitation in RA women was 4%, 4.8% and 68.3% respectively due to upper limbs, lower limbs and both limbs. Frequency of extra articular manifestations among RA women was 2.2% (nodules) and 0.3% (vasculitis). According to the physician’s global assessment of RA 55.8% of women in this study had mild, 33% moderate and 1.5% had severe disease.

The majority of RA women (87.8%) were on Methotrexate, 46.3% Steroid, 32.8% Chloroquine, 22.5% Sulphasalazine, 6.3% Lefumide and 1.3% Azathioprine. 33.5% of RA women presented in this study were taking anti-anxiety medicines.

For measuring pain and disability of RA patients, of the modified Indian version of HAQ was used. HAQ is an instrument which helps in measuring functional physical disability and pain in the language best understood by the patient. HAQ reflects the impact of the disease or its therapy on quality of life. In this study, the researcher used modified HAQ for Indian (Asian) patients that designed and validated by Chopra et al\textsuperscript{109}. HAQ is based on 24 questions indicating the degree of difficulty (0 = no difficulty 1 = some difficulty, 2 = much difficulty, 3 unable to do) in performing tasks in 8 functional areas (dressing, arising, eating, walking, hygiene, reaching, grip, activities). High values of HAQ score represent poor health.
In this study, the maximum HAQ based inability has been reported in “arising” followed by hygiene related activity. 84.0% of RA women in this study had mild HAQ disability and 2.8% severe disability.

The other most common Quality of Life (QOL) instrument to measure functional and mental status among RA patients is SF-36. SF-36 allows scoring of the eight dimensions of health: Physical function, role limitations due to physical health problems, bodily pain, general health, vitality (energy), social function, role limitations due to emotional problems, and mental health. SF-36 scores with low score indicate poor health.

Based on SF-36 questionnaire in this study, 3.8% had difficulty all of the time in performing the work due to physical health problems. 31.8% of women had severe bodily pain which did not interfere with their normal work. 32.8% of RA women believed that they get sick easier than other people. Also 50.8% of RA women reported that the rate of their general health was good. About Mental health status, 36.8% of RA women were nervous, 20.0% down in dumps and 29.0% were depressed some of the time. Also 42.5% and 47.5% were peaceful and happy most of the time respectively. Most of RA women did not have any role limitation due to emotional problems. In 43.3% of RA women the disease did not interfere with their physical health or emotional problems related to social activities at any time. In vitality / energy item of SF-36 questionnaire, 51.5% of RA women felt full of life most of the time, 48.0% had a lot of energy some of the time, 50.8% did not feel energy and 47.3% felt tired some of the time.

5.1.3 Results of common symptoms and signs, clinical examinations and laboratory tests of RTI among RA women

Among RA women presented in this study, 28.3% complained of vaginal discharge. Other symptoms were itching 25.8%, low back pain 20.5%, dyspareunia 17.9%, bad odor, 16.5%, severe lower abdominal pain 14.5%, UTI 6.5%, menstrual irregularity 6.5% and vaginal yeast 3.3%. No blisters and warts were reported.
There were no signs of abnormality in external genitalia, vaginal wall, adnexal, urethra and Bartholin’s gland among RA women in this study. In 26.0%, 6.8% and 0.8% of RA women the vaginal discharge were gray, cottage cheese like and purulent frothy respectively.

The report of cytology for RA women presented in this study was bacterial vaginosis for 32.0%, candidiasis for 6.5% and trichomoniasis for 0.8% of RA women. None of the women in this study tested positive for serological test for syphilis.

5.1.4 Prevalence of RTI among RA women presented in this study
Based on self-reported symptoms 47.3% of RA women in this study were reported to suffer from RTI. 43% RA women had positive findings of RTI in clinical examination. Based on positive laboratory methods, 39.3% of RA women had RTI. Also 7.3% of RA women had RTI derived from laboratory tests but did not report any symptoms.

5.1.5 Association between demographic, socio-economic features, hygienic information, clinical features of RA disease, HAQ and QOL scores in the study subjects
Several factors such as socio-economic and demographic, also socio cultural, hygiene practices, history of disease and medicines were analyzed to determine risk factors of RTI. In this study several independent risk factors were identified -women under 30 years, living in house with 1-2 rooms, use of public toilet, having intercourse in menstruation period, not washing genital area after intercourse, using cloth for menstruation bleeding, Chloroquine use, inability in taking bath and getting on and off the toilet (hygiene item of HAQ), high total HAQ score, and also nervous for some time(SF36), limited a lot in moderate activities (SF36), lifting and carrying groceries (SF-36)- However in multivariable analysis, only five factors remained significant-women under 30 years (AOR: 2.4, 95% CI: 1.2-4.9), small residence (AOR: 2.5, 95% CI: 1.2-5.1), improper linen for menstruation bleeding (AOR: 1.9, 95% CI: 1.1-3.3), limited moderate activities in quality of life questionnaire (AOR: 1.4, 95% CI: 1.1-2.6) and oral disease modifying anti rheumatic drugs (AOR: 3.96, 95% CI: 1.9-7.9).
As mentioned above, the first purpose of this study was to determine the prevalence of RTIs among RA women in reproductive ages. Epidemiologic data show that prevalence of various RTIs vary greatly between countries and even between regions within a country, for example according to the survey of Indian government (NFHS- II 1998-99) the prevalence of RTIs among Indian married women 15-49 years was 30%-40%. Indian NFHS III (2005-6) reported 11 percent of women and 5 percent of men age 15-49 who have ever had sex had an STI symptom in the 12 months preceding the survey-based on self reports. Since these prevalence rates are based on self-reports and because the willingness of women to talk about and report reproductive tract infection may vary by state, considerable caution should be used interpreting differences in prevalence between states. The prevalence of RTIs in Tamil-Nadu (1996-97), New Delhi (2001), Meerut (2006), Andhra-Pradesh (2007) was 38%, 36.7%, 35%, 26.9% respectively. A study from Bangladesh-Dhaka (1996-98) reported prevalence rate of RTI was 21%. RTI was reported 10.5% in Lebanon (2003), 26% Nepal (2006), 64% Lao (2007), 76.4% China (2010) and 37.6% in Iran (2011).

In this study the prevalence of RTI among RA women was 39.3% according to cytological findings and by self report 47.3% while by clinical examination were 43%. Thus this research indicates a surprisingly high prevalence of RTI among married RA women between 15-49 years of age.

The second aim of this research was to identify common symptoms of RTIs among RA women. The most common symptom of RTI perceived was vaginal discharge (28.3%). This was not unexpected as previous reports have shown vaginal discharge as a common complaint among cases referred to the gynecological clinics. So this is in line with finding from other studies reported on RTI symptoms. Itching in 25.8%, lower back pain in 20.5%, dyspareunia in 17.9%, bad odor in 16.5%, severe lower abdominal pain in 14.5%, UTI in 6.5%, menstrual irregularity in 6.5%, vaginal yeast in 3.3% were other common symptoms in this study. No blisters and warts were reported in this study. An exploratory study among married women aged 15-45 years in Orissa (2007) has indicated the commonest symptom of RTI/STD was vaginal discharge (91%) followed by lower
abdominal pain (64%). Other common associated symptoms were back ache (76%), vulval itching (51%) and dysuria (34%)\textsuperscript{72}.

The third aim of this study was to determine the common causes of RTI depending on laboratory tests among sample population. Results of this study have shown that 32% of RA women had bacterial vaginosis, 6.5% \textit{Candida albicans} and only 0.8% had \textit{Trichomonas vaginalis}. Syphilis was not observed among target population. In this study bacterial vaginosis has been reported as the most common cause of RTI, while there are many different reports about bacterial vaginosis in developed and developing countries- as mentioned in the chapter of review of literature - e.g. bacterial vaginosis in Asian women (2002)\textsuperscript{46}, reported 22.0%, 25.0% in Lao (2007)\textsuperscript{52} and 53.0% in Mexico (1993)\textsuperscript{34} and 9.0% has been reported in UK (2000)\textsuperscript{42}. In India the prevalence of bacterial vaginosis has been reported to be ranging from 14.0% - 62.0%. The prevalence has been reported to be 62.2%, 15% & 14.3% in rural Maharashtra (1989)\textsuperscript{57}, Mumbai (1996)\textsuperscript{61} and New Delhi (2001)\textsuperscript{63} respectively. The prevalence of \textit{Candida albicans} and \textit{Trichomonas vaginalis} in Lao(2007),\textsuperscript{52} was reported 40.0%, 3.7% and in Mexico (1993),\textsuperscript{34} 36.5%, 4.0% respectively. In India \textit{Candida albicans} has been reported 9.3%\textsuperscript{65} - 88.9%\textsuperscript{74} and \textit{Trichomonas vaginalis} 7.9%\textsuperscript{65} - 50.0%\textsuperscript{74} (in two areas of Garhwal region of the Himalayas, Uttarakhand (2002) and in urban slums of Tirupati town, Andhra Pradesh (2007) respectively)\textsuperscript{65, 74}. In Indian studies syphilis was documented at levels of less than 1.0%- 14.0%. Nandin Ooman (2000) in her study reported laboratory assessments of RTI prevalence from eight studies among Indian women.\textsuperscript{9} Since the studies used different laboratory procedures and criteria for diagnosis, these figures are not comparable and show significant variations. However the prevalence of bacterial vaginosis reported in a range of about 14-62 percent. Candidiasis ranged from 2 percent to 34 percent, and trichomoniasis from less than 1 percent to 14 percent. Also syphilis was documented at levels of less than 1 percent to 10 percent, depending on the method used. Radhika Ramasubban (2000)\textsuperscript{75} reported syphilis continues to be the most widely prevalent STI among both men and women, ranging from between 10 to 15 percent of all cases (men and women) to around 46 percent in India. On the other hand S. Hawkes (2002)\textsuperscript{76} explained there are wide variations in both the reported prevalence of syphilis and diagnostic criteria. Although variations in sample size and diagnostic procedures account for
some of the differences, the high prevalence of syphilis among women in some parts of the country is in little doubt. Majority of studies have been conducted on select groups with different diagnostic tests. Therefore, these studies do not reflect the true prevalence of syphilis in general population.

Accurate statistics regarding the magnitude of RTIs is varied because of varying source of information, methodologies and technologies of measurement. A lack of standardization in laboratory criteria can influence rates reported, and studies cited do not use either comparable sampling method or laboratory diagnostic test which lead to an epidemiological diversity.

The final aim purpose of this study was to assess risk factors of RTI among RA women. Most RA women with RTI were under 30 years. This is comparable with other reports of young married women were high risk of RTIs.\textsuperscript{39,52,56,69,70,120} 46.8% of RA women in this study who were living in houses with 1-2 rooms had RTI. Low socio-economic status (poor housing) affected women’s health status. Also limited number of room can deprive a privacy environment for partners for doing hygenic practices regarding to intercourse. In this study the association between occupation of RA women and RTI was seen as not significant. A cross-sectional, community-based study of RTIs was carried out in 1996-97 among married women 16-22 years of age in a rural community of Tamil-Nadu( India) has revealed that women who worked as agricultural laborers had an elevated likelihood of having as STIs, as did those married five or more years.\textsuperscript{56} Use of public toilet was a risk factor of RTI among RA women in this study. Toilet is the most perceived mode of contracting RTI’s in different studies.\textsuperscript{121,122} Lack of adequate sanitation could potentially facilitate transmission where transmission through genital fluids occurs when sharing bath towels and toilet seats.\textsuperscript{122} Absence of water for washing after toliet is also associated with UTI and genital infection. Besides, the presence of piped water is a condition for better access to water and washing genital area- after coitus or after urination - as compared to other types. Also 54% of RA women did not use commercially available sanitary materials during menstruation days. All these findings are in line with a study conducted in Shimla city (2006)\textsuperscript{71} among reproductive ages women. In this study menstrual hygienic practices such as- use any type of non sanitary pad during menstruation– has shown the highest prevalence
of RTIs. It is assumed that the risk of RTI is higher than normal during menstruation because the plug of mucus normally found at the opening of the cervix - neck of the uterus - is dislodged and the cervix opens to allow blood to pass out of the body. In theory this creates a pathway for bacteria to travel back into the uterus and pelvic cavity. In addition, the pH of the vagina is less acidic at this time and this makes yeast infections such as thrush (Candidiasis) more likely. The majority of RA women who did not wash genital area after coitus and those who had coitus among menstruation days had RTI. A study from China (2003) has shown the importance of reproductive health behavior for prevention of RTI. Practices of washing before and after sexual intercourse, taking a shower daily, washing during menstruation are reproductive health behavior for prevention of RTI.

The majority of RA women with RTI were on Chloroquine. According to Monthly Index of Medical Specialties (MIMS) Chloroquine is deposited in the tissues in considerable amounts. In animals, from 200 to 700 times the plasma concentration may be found in the liver, spleen, kidney, and lung; leukocytes also concentrate the drug. The brain and spinal cord, in contrast, contain only 10 to 30 times the amount present in plasma.

Chloroquine has also affinity for melanin and it gets concentrated in pigmented (melanin-containing) structures which may explain its toxic effects on the eye (keratopathy and retinopathy) and that on the skin when used over a prolonged period for treating rheumatoid arthritis, systemic/discoid lupus erythematosis and other connective tissue disorders. Dermatological toxic effects include photosensitivity, photo allergic dermatitis, rashes, pruritus, bluish-black, grayish or brown pigmentation of skin and mucous membrane, discoloration of nail beds, bleaching of hair and eyebrows.

Other study demonstrated palate hyper pigmentation caused by prolonged use of Chloroquine due to deposition of drug metabolites in the mucosa. Also one study has been found that Chloroquine enhances viral replication in mice. It may suggest a possible connection between the increased spread of AIDS in
endemic malaria areas and the wide use of Chloroquine in those areas for the chemotherapy of malaria.

As reported by Davidson et al. 128 said by research published in the journal PLoS ONE, an overuse of Chloroquine treatment has led to the development of a specific strain of E. coli that is now resistant to the powerful antibiotic ciprofloxacin. E. coli, which lives normally in the rectum, can be transferred to the vaginal walls also causing Bacterial vaginosis- Bacterial vaginosis was the most prevalent RTI in this study.

There are no studies on the side effects of Chloroquine which lead to RTIs. Possibly deposition of Chloroquine metabolites in the vaginal mucosa- like skin, oral mucosa, upper lip, and hard palate- leads to change of vaginal pH or perhaps its relation with development of a specific strain of E. coli is responsible. Hence for assessing of Chloroquine mechanism on RTIs more study among RA women is necessary. Such studies help healthcare professionals for awareness of these drugs and their adverse effects in order to decide on the optimal treatment for the condition, or refer the patient to an appropriate specialist.

According to HAQ, inability in taking bath and getting on and off the toilet (hygiene item) were risk factors of RTI among RA women presented in this study. SF-36 questionnaire shows a lot of limitation in moderate activities, and limited a lot in lifting or carrying groceries (physical functioning item) were seen in a majority of RA women with RTI. Limitation of above items regarding to HAQ and SF-36 questionnaire (hygiene and physical functioning item) may indicate strong association among hygienic practices and RTI.

According to this study with lesser age of marriage the rate of RTI increases among the sample population however the association between age of marriage of RA women and RTI was seen as not significant. RTI was present among 50.0% of RA women who were married at 10-15 years of age and in 39.3% who married at 16-20 years of age. It was present in a lesser proportion (33.3%) of RA women with marriage age of 26-40 years. Also Pant Bhawana (2006) 69 reported that lower literacy, poor hygiene, early sex were with higher prevalence of RTI among women in rural area of Meerut.

No previous studies reported RTI and its risk factors among RA women.
5.2 IMPLICATION OF THIS STUDY

This study indicates a high prevalence of RTIs among RA women and the above results show RA can be a probable risk factor for RTI. Since prevalence rates of RTIs are a vital indicator of a population’s reproductive health according to the high prevalence of RTI in this study, the researcher suggests:

1- To impart awareness of RTI symptoms and its complications and counsel patients during treatment of RA women.

2- To encourage and educate the RA women to mention their RTI symptoms.

3- To ask questions about the present symptoms of RTI in each visit of RA patients.

4- Physicians should be oriented and sensitized for identifying various signs and symptoms of RTI and be able to treat or refer the patients to centers which can treat their RTI.

5- Annual vaginal examination of RA women and taking Pap smear as a routine examination and laboratory test of RA women for early diagnosis of RTI.

6- To consider health policy formulation and program development for provision of clinical services and provide reproductive health care facilities (to develop and validate low cost diagnostic tests and treatment of RTI) directed to RA women with RTI.

7- Provision of safe water and sanitary toilets which can reduce the risk of RTIs along with other health benefits to the RA women.

8- To provide information and education to RA women for the promotion of hygienic sexual behavior, genital and menstrual hygiene.

The findings of this thesis will help RA women to improve on their reproductive health and become a precedent for starting more studies among women with chronic disease.