

REVIEW

Women with leprosy A woman with leprosy is in double jeopardy

MATTHEW JOHN HUNTER SHALE

School of Medicine, University of Sheffield, Sheffield, UK

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Introduction

Leprosy is a major public health problem in much of the developing world, and is the subject of intense effort to reduce this threat. Men and women may be affected in different ways, be they biologically or socioculturally.¹ Leprosy is a visible disease, and carries fear and stigma. It is suggested that women, already socially inferior to men in many societies, suffer greater problems than men in such matters as receiving health education, access to treatment and mobility. Hardship resulting from the disease is probably felt more by women than men, with greater social and marital rejection and loss of self esteem. The following is a discussion of the biological (sex) and sociocultural (gender) aspects of the disease in women, and tries to assess whether the female leprosy patient really is in greater jeopardy than her male counterpart.

The disease

Leprosy is a chronic inflammatory disease, caused by *Mycobacterium leprae*. The period between infection and development of symptoms is often between 2 and 10 years.^{2,3} The presenting features of the patient depend mainly upon ability to generate and maintain a suitable immune response, particularly cell-mediated immunity (CMI). The clinical spectrum⁴ ranges from tuberculoid leprosy (TT) at the one extreme, to lepromatous leprosy (LL) at the other. Between these forms lie the immunologically unstable borderline forms. Tuberculoid leprosy represents a strong CMI response by the host. Visible signs are usually limited to one skin lesion; smears or biopsies reveal few if any bacilli.

Lepromatous leprosy arises from the relative failure of cell-mediated responses, and is a generalized condition involving many systems; particularly skin, nerves, testes, eyes and nasal mucosa.

Correspondence to: M. J. H. Shale, 64a Sydney Road, Crooksmoor, Sheffield S6 3GH, UK. Tel: +44-114-2684019.

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Sex related patterns of leprosy incidence

Sex differences in the incidence of leprosy are influenced by the population studied, with various Indian studies reporting male:female ratios from 2:1 to 1:1.^{5,6,7} In Africa, there is a similar ratio of 2:1 observed in Ethiopia^{8,9} but a reversal of this is reported in Malawi (61% females),¹⁰ Chad (59% women),¹¹ and Burkina Faso (a ratio of 1:1.5).¹² In Venezuela, the ratio is 1.8:1,³ and in Turkey almost 3:1.¹³ Many of these figures represent the number of patients registered for treatment, and as discussed below, women are less likely voluntarily to report for treatment. Women are up to twice as likely to develop TT leprosy than LL in many studies around the world,^{8,14} and since TT patients are often treated for shorter periods, are less likely to be on registers of active cases. Women are more likely to develop sub-clinical leprosy on exposure to *M. leprae*, shown by the increased reactivity to skin testing in female contacts of leprosy patients.^{3,14,15}

Reactions

A key feature of leprosy is the occurrence of reactions; immunologically mediated events occurring with changes in CMI. Type 1 reactions (reversal reactions, RR) occur mainly in non-lepromatous patients and present as scaly, swollen erythematous skin lesions and neuritis. The reaction lasts from days to months, and represents an upgrading of CMI. Type 2 reactions (erythema nodosum leprosum, ENL) occur in LL patients and present as crops of erythematous papules with systemic features such as neuritis, arthritis, iritis and orchitis. Due to reasons discussed below, reactions are more common in female patients.¹⁶

Endocrine factors have been shown to affect the immune response, and testosterone is immunosuppressive of CMI responses.¹⁷ Oestrogen, shown to increase the antibody response, remains unproven as a promoter of CMI.

Deformity and disability

Deformity is a greater problem amongst men, who suffer more moderate and severe deformity than women,^{10,11,18} related in part to their greater risk of developing LL and lower compliance rates. Deformity occurs when nerves become damaged either by the disease or during a reaction. Deformity in women tends to be of the hands, possibly due to damage from household work with anaesthetized hands.^{13,19} In Chad, it is noted that women are less likely to have deformity at the time of diagnosis, so that with proper treatment they may avoid disability.¹¹

Fertility

In many leprosy-endemic societies, childbearing is an important activity for women, and large families are prized. The association of leprosy with female infertility is not as clear as in males, where scarring of the testes by the disease is acknowledged as often causing infertility.²⁰ A study in India has reported lower numbers of children to leprosy mothers,⁵

but uses a cohort from a leprosarium, making the effect of infertility hard to differentiate from the effects of associating only with potentially infertile males, and the increased use of contraceptives in hospital settings. There is little evidence of women's knowledge about the effect of leprosy upon prospective children, and since many societies still believe it to be a disease of heredity, some women may avoid pregnancy.

Pregnancy

There is a paucity of contemporary data on leprosy and pregnancy. Lockwood and Singha²⁰ have recently reviewed all published data on leprosy and pregnancy.²¹ Most of the available studies were done in pre-MDT days with inappropriate controls and is thus difficult to interpret. Pregnancy results in depression of CMI by the fetoplacental unit,²² thus the pregnant patient may be postulated to be at risk of new disease, relapse and reactions.^{2,23–26} An Ethiopian study²⁶ of 120 pregnancies in 154 patients suggested that reactivation of leprosy does occur during pregnancy whilst a recent Venezuelan³ study in 54 pregnancies did not find this.

There is a clear temporal association between parturition and the development of type 1 reactions, when CMI returns to pre-pregnancy levels.²⁵ In the Ethiopian study 60% of type 1 reactions occurred during the post-partum and lactation phase with 42% of BL patient pregnancies being complicated by a type 1 reaction. In the same study LL patients experienced ENL reactions throughout pregnancy and lactation.²⁷ ENL in pregnancy is associated with early loss of nerve function compared to non-pregnant individuals.²⁸ Neuritis is an important complication of pregnancy and parturition, since significant numbers of women may develop nerve damage associated with pregnancy and lactation.²⁹ Thus pregnant and newly delivered women should have regular neurological examination.^{30,31} Without appropriate treatment the patient risks developing nerve damage and disability. Educating women and their carers about the complications of leprosy in pregnancy should be a priority. A unique danger to women is that even after release from treatment they may be vulnerable to reactivation of persisting bacilli due to the depression of CMI during pregnancy. There is an urgent need for a prospective cohort study of women of childbearing age with leprosy so that the risks of leprosy complications in pregnancy can be documented and patients advised on the basis of current good evidence.

Offspring

When a leprosy patient does get pregnant, babies are affected in accordance with the mothers leprosy. Placental function is reduced by leprosy, and intrauterine growth retardation occurs commonly in babies of LL mothers.^{32,33} Respiratory defects are the commonest cause of neonatal mortality associated with lepromatous mothers.³³ Passage of the disease to offspring is a controversial topic, with several studies finding for and against placental transfer of bacilli.³⁴ The reduced birth weight of babies born to leprosy mothers combined with an increased susceptibility to neonatal gastrointestinal infections may lead to failure to thrive.² Death of infants is usually the trigger for further pregnancy, and multiple pregnancies have the same detrimental effects on general health as they do in non-leprosy mothers, as well as the multiple effects of reactivation of the disease on nerve damage.

Medication

Since 1982, due to the increased emergence of dapsone resistance, the World Health Organisation (WHO) has recommended that leprosy treatment should consist of three drugs, including dapsone, (multi-drug therapy, MDT).³⁵ The MDT regimen for multi-bacillary (MB) patients is daily self-administered dapsone and clofazimine, together with monthly supervised rifampicin and clofazimine. These treatments are continued for a minimum of 2 years for MB patients, and 6 months for PB patients. These drugs are powerful, and may occasionally have side-effects of which women are rarely warned. Rifampicin has the effect of turning urine, tears and breast milk reddish brown, and may (uncommonly) induce jaundice initially.³⁶ Clofazimine produces reddish brown skin pigmentation and may lead to discontinuation of the treatment, and wariness of western medicine.^{36,37} There seems to be little warning of these effects to patients.¹⁴ Common side-effects of both treatments include gastrointestinal upset, especially diarrhoea, a serious risk to generally undernourished females in the developing world. Both dapsone³⁶ and rifampicin can occasionally cause haemolytic anaemia, which may be of increased significance in already anaemic, menstruating women and dapsone can affect folate metabolism, and in chronically undernourished patients, may be significant in the development of anaemia. Despite the lack of proof of teratogenicity, some women stop taking their medication in pregnancy, and this may contribute to downgrading phenomena, and the evolution of secondary dapsone resistance. The commonly used treatments for reactions are prednisolone, clofazimine and thalidomide. The use of prednisolone in pregnancy and lactation must be closely supervised, and the use of thalidomide is problematic in premenopausal female patients. Effective drugs for the treatment of reactions and proper supervision are not always available in control programmes.

Persisting female inequalities

In general, women are socially disadvantaged, with cultural and economic problems, and female leprosy patients suffer increased stigma.^{3,6,11,13,30,38-40} Education for women is a low priority in many societies, and rates of illiteracy amongst females range from 74% (44% for males in same study) to 100% in various leprosy endemic regions.^{6,11,13,14} In India, around 80% of women, regardless of class or education, engage in household work, causing dependence on husbands for economic support.⁴⁰ Leprosy, due to stigma and deformity, makes women unable to continue household work, and they may lose status in the family and end up leaving their homes.^{5,6,40} Women are expected to put their family before themselves, and may fail to seek help early in the disease, being unable to find time to leave their family.¹ Women are less able to travel for treatment,^{6,40,41} and seldom do so alone, usually accompanied by a male companion.^{40,42} The health of a female relates to the number of other women in the family, and when there are two or more female family members, their health is generally better.⁴² A common complaint, particularly amongst Muslim women, is of a generalized syndrome of 'body pains', explained by some observers as being the result of oppression, fatigue, and general health issues including malnourishment, vitamin deficiency, and anaemia.¹⁴ Males rarely perceive the inequalities in health care faced by women, and since policy decisions are made by men, women's concerns are unlikely to be acted upon.^{6,38} It is clear that 'just being a woman' is a danger in some parts of the world, even without the problems of leprosy.

Disease knowledge

The patients knowledge of their disease is influenced by factors including the effectiveness of public health education programmes, the ability of patients to grasp (and accept) concepts presented, and the access patients are given to such information (women may not be allowed access by their husbands). In many cultures there are ancient beliefs regarding diseases such as leprosy. Some reject the concept of germs as causative agents, and view disease as divine punishment or an inherited problem.^{6,14,30,43-45} The Hindu religion views deformity as a divine punishment, and there is a strong association in many peoples' minds between leprosy and poverty.³⁰ Lack of belief or confidence in conventional medicine, which often conflicts with their traditional world view, leads to patients seeking primary treatment from local healers. In Pakistan it is noted that only 3/41 primary consultations by females were to qualified conventional physicians³⁷ and that up to 22 years had being wasted on ineffective folk cures in some cases.¹⁴ Illiteracy contributes to problems understanding the messages of western health beliefs. It is easier to accept an explanation that is understood and accepted culturally, such as evil spirits. Data from Pakistan have shown that only 5/128 patients (of both sexes) accepted the germ theory of disease, including 69 hospital inpatients with long-standing disease, and 73% saw their leprosy as a punishment from God.¹⁴ Studies in India have shown changing health beliefs between established and newly diagnosed patients, with fewer new patients relating leprosy to past 'sins'. Females show a greater change in this knowledge than men.⁶ With respect to the delay in seeking western medical treatments after the first appearance of skin lesions, a larger change was noted amongst females (from 5 years amongst established patients, to just over 2.5 years in new patients) than males (from over 3 years to 2 years), but males are still more likely to seek early western treatment. The period between identifying the skin changes as leprosy, and seeking western treatments is reduced for newer patients of both sexes, to around 1 year, although all females first sought traditional advice.⁶ This is compounded by the problem of health personnel rarely being aware of the disease's earliest manifestations.^{14,31,39} Delay in seeking conventional medical assistance has been shown elsewhere to influence prevention of deformity and sensory loss.⁴⁶ In Pakistan 52% of patients initially sought help from folk healers.¹⁴ These figures suggest that health education is increasingly reaching women but that they still do not, or cannot act upon it appropriately. Regardless of women's knowledge of disease, their access to treatment relies upon male sanction.³⁸ Men, whilst less willing to accept health education messages are more likely to act upon the advice given, perhaps due to their higher educational status and greater freedom. Regardless of the success in imparting information, it must be backed up with easily available facilities, for if they are hard to obtain patients will turn to traditional healers.

Case detection

Women are less likely to come forward for medical assessment and treatment than males, and benefit from the implementation of active case finding programmes.³⁹ In both India and Pakistan, contact surveys and general surveys yielded more female cases than did self reporting or referral.^{6,39} Part of the problem in detection may stem from cultural attitudes to examination of females, particularly young unmarried girls, who keep themselves covered and may hide the signs of disease. Many hospitals and clinics are exclusively male staffed,

and this is a problem for many women in trusting, and confiding in men, who elsewhere are so above females, that women may not even be allowed to talk in front of them.³⁸ Many women are put off western clinics by disparaging attitudes of male staff not encountered in traditional healing settings.^{14,37} In many societies, primary health care is provided by village housewives, and thus a woman risks stigma and discrimination within the community if she seeks treatment for her disease.

Compliance

Studies have variously shown similar, and greater levels of compliance amongst female leprosy patients than male patients.^{6,11,14} Compliant behaviour relates to factors such as acceptance of the condition and the need to treat it, beliefs about the value of treatment, including the speed of improvement and lack of side effects, and the quality of the relationship with the doctor.¹⁴ This model fails in application in the developing world, due to multiple and opposing beliefs regarding medication, and the common reliance upon and compliance with traditional remedies. In females, far more so than men, their low social status and greater conformity to behaviour expected by others increases their acceptance of doctors orders,^{6,14} without understanding the reasons for treatment. The major barriers to compliance, regardless of gender, include denial of actually having leprosy, reliance upon traditional treatments, and undesirable side effects.^{3,14,51} Denial may be an attempt to avoid the negative social effects of such a diagnosis, and often leads to consulting traditional healers for primary help, and reappearing at clinics when this approach fails. In Nepal,⁴¹ increased levels of clinic attendance and compliance relate to increased distance of habitation from the clinic, showing that fear of being recognized by the society in which they live has negative effects on acceptance of diagnosis of treatment. Greater levels of compliance in females may relate to social status, since a study in Venezuela³ of a more prosperous group of patients than the slum dwellers of the Pakistan study, reveals no significant difference in compliance between sexes. This observation may reflect religious differences in the different study areas. Much of Asia is Hindu or Muslim, religions that offer many traditional treatments, while South America has a stronger Christian base, and Christianity does not offer so many alternative treatments. Other studies confirm compliance is reduced when there are alternative treatments to turn to if one medication seems slow acting or has side effects.^{6,14,37,47} Studies examining the patients understanding of their treatment reveal that women often misunderstand the side effects of their drugs, and education measures are hampered by a similar lack of knowledge amongst health workers.^{5,14,38} The danger of this educational void is highlighted by the prescribing of prednisolone, which has such a rapidly noticeable effect, that patients demand and receive repeated doses from health workers who know no better. Its immunosuppressive function can cause a detrimental effect in the longer term.⁵ Thus women are at risk from a lack of knowledge of their specific needs as opposed to men in prescribing situations. This situation is compounded by the private health system in many countries, where patients will swap physician readily if they are not given the treatment they want, and the availability in some regions of antibiotics and corticosteroids without prescription.^{14,37} There is an enormous lack of understanding of medicines in general, illustrated by women's beliefs that large, coloured vitamin tablets have a more beneficial effect than small plain dapsone tablets, which are obviously biologically far more effective.⁵ Female compliance may also be negatively affected by the use of blister packs, to aid regular treatment, since

many interpreted these as similar to contraceptive tablets, which are frowned upon in many societies. Without blister packs, however, treatment is difficult, since MDT as recommended is now available free of charge from WHO, exclusively in blister packs for PB and MB patients. In the same way that acceptance of the diagnosis is required for compliant behaviours, so is an acceptance of western beliefs about disease, before acceptance of western treatments occurs. Data on rates of compliance measure only compliance with western medications, ignoring the rates of compliant behavior in those taking traditional remedies.¹⁴ Male control of family money means that if women are to get treatment, they must inform their husbands of their illness, risking the repercussions, and their choice of treatment may thus be male influenced.^{14,37,38} Since free treatment is increasingly available, it is more likely that beliefs about disease and availability of treatment reasonably near the house are the biggest barriers to compliance amongst women; for example, 36% of Indian women face problems in affording travel to clinics.⁴⁰ Acceptance of western theories of disease does not necessarily lead to acceptance of western remedies, since some patients believe such treatments cause other problems rarely encountered in traditional remedies, and are thus less keen to take them.³⁷ Misunderstanding the purpose of the medication leads to lower levels of satisfaction and reduced compliance. In India, up to 24% of women are not satisfied by the response to medication, especially since it cannot reverse deformity, and does not seem to have 'visible' effects. Patients are apparently rarely told of either the function or effect of the drug, or the long-term nature of treatment, and tend to cease taking the drug when symptoms are reduced, leading to recurrent disease, and drug resistant infection.^{5,14,47} Patients often combine several treatments, making personal assessments of their efficacy very subjective. Despite greater compliance, the greater delay in starting treatment means women may not avoid the problems of deformity.⁶

Social effects

Leprosy carries an enormous stigma, mainly attached to the dermatological problems and limb deformity it can cause.^{6,30,40,48} Other factors including the widespread view of the disease as one of poverty, the belief that it is a disease of the 'unclean', and the view amongst healthcare workers that it is a disease apart, only for dedicated specialists, leads to an atmosphere of fear and confusion regarding the disease and its victims. Due to the widespread interpretation that leprosy results from sin or religious indiscretion it has social repercussions in many communities, regardless of education, affluence or religious factors.^{3,5,6,40,45} The very diagnosis induces negative attitudes, and patients with few obvious signs of disease suffer as much ostracism and stigma as those with deformities. Unsurprisingly, females with their lower social status are more affected by their disease than males. In Indian patients⁶ females are up to 3 times more likely than men to find restrictions on activities such as going out, travelling, and attendance at festivals. These exclusions are imposed and accepted by men, and women tend to comply. Widespread social discrimination explains the relatively low levels of female patients informing the community of their disease (around 30%)⁴⁰, and of these, almost half faced abuse directly related to their disease. Most of these were allowed to maintain community contact with others, but around a third reported restrictions on using community places. Other studies have looked at social effects on mixed sex groups, and these show that leprosy patients in general are shunned by neighbours, lose their jobs, become ostracized and face abuse directly relating to their condition.^{13,14,31,43,45,49}

Marriage and family life

In much of the developing world child bearing is both expected and admired by society, and large families are more desirable and respected than small ones. Men marry, often by arrangement, women who are likely to bear many healthy children. A stigmatizing disease such as leprosy is not a desirable attribute in a prospective partner, especially in societies that still see leprosy as inherited. Tanzanian men seek wives who are industrious, obedient and above all fertile.³⁸ Problems with subfertility are widely reported in female leprosy patients, as discussed above. In Ethiopia,⁵⁰ 97% of respondents would not permit marriage of a family member to a leprosy patient, and marriage rates amongst female leprosy patients are low. The chance of a female patient's marriage surviving her diagnosis appears related to several factors,⁵ i) a strong marriage prior to diagnosis, and support from the husband in seeking treatment (whether this support reveals a more accepting attitude, and consequently less compulsion to eject the wife is unclear), ii) early detection and consequent low deformity and iii) good fertility, and multiple children (and therefore higher social status); only 6% of the group of non-dehabilitated patients were childless. In surviving families, up to a quarter of female patients suffer strained relationships, unrelated to socioeconomic or educational status.⁴⁰ In India there is a marked decline in case reporting amongst females, between the ages of 10–19 years, when most marriages are being arranged, and a large increase above the age of 20, far above the rise amongst males.³⁹ This appears to be a cultural effect, since this age group records the greatest incidence of new disease in South American women.³ This may be due to the fear that diagnosis before marriage of leprosy would spell disaster for both patient and family, a less likely outcome in more developed countries. It might also relate to the cultural unacceptability of full examination of girls in this age group by doctors, and the consequent hiding by patients of outward signs of disease. Leprosy contracted after marriage has a serious effect upon the patient, borne out by high rates of negative attitudes to wives with leprosy from husbands.^{5,40} Women are more likely to tell their families of their disease than men. This prejudice seems to be one that cannot be solved by education, since there is no difference in attitude according to educational status. Harsh treatment from husbands, and divorce are not only common occurrences, but widely expected ones. Under Muslim, Hindu and Indian law, leprosy was grounds for divorce, and in Saudi Arabia 14.4% of divorces are attributed to leprosy.⁵¹ A quarter of Indian female patients fear divorce, regardless of their husbands' apparent attitudes.⁴⁰ Even if the female remains with her husband, she may find herself segregated to a greater extent than a male patient would. Despite lower rates of deformities compared to males, and few women finding difficulties with their household tasks, female patients suffer up to 5 times higher rates of restriction on everyday activities than male counterparts. (Table 1).

Intimacy within marriage appears as unavailable to female patients as marriage is, with females more likely than men to be denied sexual attention. This may relate to the female subservience within a relationship, that she is less likely to (be able to) deny her partner sexual relations.⁵ Being so likely to be 'spurned by her husband is an enormous insult, and to women expected to be wives and mothers, this removes much of her purpose for being. Being prevented from engaging in typical female activities such as cooking leads to further loss of self worth, and a raised likelihood of choosing to leave the marital home (dehabilitation). Amongst dehabilitated patients, 68% of males chose to leave, but only 49% of women took this decision themselves; 31% were made to go by their family, compared to 20% of males. Women who remain are more likely to encounter negative attitudes from their partners than men. Fear of deformity (63% of

females, 49% of males), and future forceful debilitation, was a concern that led to females voluntarily leaving the household, despite similar rates of actual deformity. Another factor in deciding to leave was to avoid prejudicing the chances of future marriage for their relatives, expressed by 35% of this cohort, and by patients in other studies.^{5,14} The type of family in which the patient lives can affect the impact of the disease; patients face less hardship in nuclear rather than extended families.^{6,40} There is no significant difference in disease understanding, but negative reactions are more likely in joint families, and some families split up as a result of leprosy.⁵² Some observers report a change from joint family status at the time of diagnosis, to nuclear families later in the study.^{5,6} This effect may be due to the major differences in status within the family of females, with women up to 10 times less likely to be heads of their family, either when diagnosed or followed up. Curiously, there does not appear to be a significant effect of the disease barring women (or men) from attaining status as head of the household,⁶ highlighting the fact that the status of the patient when they are diagnosed influences future events. It is possible that it reflects the breakup of families due to the disease, with women being abandoned to head what remains of the family. In families where there are two or more females, the patient is at risk of losing status within the female 'pecking order', especially if she is unable to or barred from completing household tasks. In many households, the female is responsible for health care for her whole family,^{38,53} and despite greater rates of telling their husbands, many are left to cope with their disease and treatment alone. Family awareness and help with treatment is seen to increase with increasing standards of education.⁴⁰ In many families, the decision to consult a doctor is taken by the husband, removing her autonomy to seek healthcare.^{37,38} Amongst leprosy patients, females find it harder to marry than males, and appear less 'choosy' about partners. Marriage figures from many studies are misleading, since more detailed questioning often reveals that the partner has changed since diagnosis, or that the patients may not necessarily still keep contact with their spouse. Regardless of deformity, female patients are more likely to marry male leprosy patients,⁵ who are often deformed. In this Indian study, although some male leprosy patients had married non-leprosy females, the opposite was true for one woman who married a man handicapped in a road accident.

Employment effects

Studies show female patients are less likely to be in employment, and have lower incomes than

Table 1. Restrictions on everyday activities experienced by male and female leprosy patients

Activity	Study A6		Study B5	
	Males	Females	Males	Females
Touching others	17.7%	84%	15%	25%
Eating with others	48%	63%	18%	39%
Sleeping together	20%	85.8%	20%	30%
Sexual relations	22%	71%	9%	24%
Cooking	29%	80%	—	—
Fetching water	—	—	15%	38%
Attending family festivals	—	—	9.6%	21%

both male patients, and healthy females.^{6,7,40} In an Indian study the data for unemployment and income were compared to controls from the same region matched for age, education and sex. Figures revealed that whilst leprosy patients in general had lower employment rates than control groups, females experienced greater employment problems than males, being 61% less likely to be employed than controls, with male counterparts only 30% less likely. Those females able to take work received 4 times less income annually than controls, whereas men earned only 1.7 times less.⁷ The area under study appears to affect rates of employment, and a separate study in a different area of India⁶ revealed 75% of male patients to be employed, with 49.5% of females finding work. These figures reinforce the fact that females are generally less employed than males, perhaps a sign of lower social status, but the unavailability of employment figures for some of the control groups prevents further analysis of gender influences on the impact of the disease on employment opportunities. Studies in Ethiopia⁵⁰ have identified both an unwillingness to employ and work with leprosy patients, regardless of gender. In some regions of Africa, there is also a growing trend for men to leave their family and seek better pay in employment elsewhere. Non-deformed male leprosy patients can escape local stigma in this way to find work, an option unavailable to most women. Analysis of the effects of deformity on the employment of patients is difficult to approach, since gender differentials are rarely considered.

Psychological and psychiatric effects

Psychiatric effects reported amongst leprosy patients include increased depression and anxiety, attributed to the disease and its social effects.^{40,54} Given the already greater incidence of these conditions in non-leprosy females, one can surmise that females with leprosy are in greater danger of depressive illness than male patients. These risks are highlighted by observed figures of greater suicide rates in leprosy patients,⁴⁰ although no differentiation by sex is made. Women with leprosy are at risk of stigmatization not only from the community, but also from their own (mis)conceptions about their disease. In a study in India,⁴⁰ half the sample feared transmitting their disease to others, and some acted on this, distancing themselves from others. Educated women are more likely to fear transmission of the disease to others, but less likely to act upon it than less educated subjects. This may relate to the illiterate believing sin to be the cause of leprosy, being less likely to fear spreading their illness. Diagnosis of leprosy is noted to increase the anxiety of subjects, and many report a lower threshold of anger and upset over trivial matters whilst social maladjustment appears in 30%, who preferred to be alone since diagnosis. There is no discussion of factors responsible for this, be they fear of infecting others, fear of judgement by others or simply part of a general coping strategy. With the occurrence of deformities or disabilities, almost all women express feelings of self-repulsion and embarrassment. The greatest fear noted in the study was fear for the future progress of the disease, future loss of function, and divorce, regardless of family attitudes towards them.

Discussion

The overall picture of women with leprosy is worrying. Women with leprosy face inequalities due to their sex and their disease. Healthy women are a vulnerable group, due to the expectations on them as carers and mothers. They live in a climate of fear and oppression and

many suffer physical and mental morbidity. Literacy is virtually non-existent, as is the ability to travel, or access to money for whatever purpose. These restrictions mean that access to and comprehension of, health education is limited, and women are unlikely to come forward for suitable treatment. This leads to the disease progressing unchecked for longer, and the development of avoidable problems such as deformity.

Leprosy increases women's vulnerability due to misconceptions and stigma about the disease within society. The religious leadership in many leprosy endemic regions contributes to this, with teachings on the meaning of the disease and deformity. In westernized societies, gender differences are less clear. Female patients share societies' feelings and misconceptions, becoming reclusive and psychiatrically damaged after diagnosis. Women are more likely to seek traditional healing, and are unable to access effective treatment for longer than males. Due to the stigma and cultural restrictions on examination of females, they suffer lower levels of voluntary detection than men, and need to be actively sought for treatment. When treated, women are more compliant than men, due to their subordinate conditioning, but are vulnerable due to lower levels of understanding of disease and western medication in general. In both society and home life, female patients face restrictions on their activities, and significantly higher rates of divorce and forced debilitation; often accepted without question, such is their inferiority to men. Women are often denied physical stimulation, sexual relations, and the right to continue with household tasks, leading to depression and mental pain. Most men are unaware of inequalities faced by women, and do not act to limit this gap.

Physically, women are more fortunate than men, with lower rates of LL and deformity. This advantage is lost in pregnancy, and immunologically they are left vulnerable to the disease. Many societies expect women to have multiple children, risking repetitive episodes of nerve damage.

Conclusions

The female with leprosy does indeed face a double jeopardy; her socially inferior status and her highly stigmatized disease result in greater social and mental problems, even if the disease is often less severe (physically) in women than in men. Many societies where leprosy occurs have such different views about the world, and illness that greater attention should be paid to understanding these beliefs, including attitudes to women on drug treatment. Whilst women are socially vulnerable, they are also more responsive if targeted correctly, and are responsible for the care of their family's health. Improved education of women about the disease can produce progress towards making leprosy the minor public health problem it should be. Further requirements for achieving disease control are raised levels of literacy for all, and greater education of health workers about the disease, to allow greater dissemination of information within the community. Misconceptions and misunderstanding exist about the disease in many non-leprosy specialists, and this also needs to be addressed. In summary, if leprosy is to be conquered, consideration must be given to a detailed study of the varying social conditions in leprosy-endemic countries, including attitudes to the disease and to women. Education of all about the disease, in terms they understand, and that do not dismiss or ridicule their beliefs or the teachings of their religions, is the key to success. Whilst women *are* in double jeopardy, given time and the correct measures, this need not be the case.

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