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Socio-Legal Creationism Issues and High Risk Problems of Homosexual Behaviour

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ABSTRACT

Most of us fail to comprehend why somebody would be interested in undertaking homosexual activity. In the present study, we tried to conclude some causes of such altered type of sexual behavior. Illiteracy, poor socioeconomic status and ignorance about the law may be considered as some of the factors which encouraged the accused to commit such crime. In all cases, the victim and the accused were known to each other to a variable extent indicating that the victim falls prey to the accused because he was not aware of his intentions.

Keywords: *Unnatural offences, Behaviour, High risk, Diseases.*

INTRODUCTION

A significant proportion of victims of rape or sexual violence incidents in general are male. A study conducted in England indicated that 3% of males surveyed reported experiencing non-consensual sex as adults, 5% experienced non-consensual sex as children (under 16 years of age), and 8% experienced consensual sex as children (though illegal by UK law).[1] In the United States, sexual violence against men, like women, is underreported. Generally, rape is still thought to be a crime against women specifically (and historically has been defined this way), although many cases of male-victim rape have become subject of public discussion recently.[2] Dr. Maeve Eogan and Deirdra Richardson, respectively the medical director of the Sexual Assault Treatment Unit (SATU) of Rotunda Hospital and a sexual assault forensic examiner, said that rape of males is still taboo to be spoken about and has a negative connotation among both heterosexual and homosexual men.[3]

Community and service providers often react to the sexual orientation of male victims and the gender of their perpetrators. Mostly, male victims try to hide, and deny their victimization, similar to female victims, unless they have serious physical injuries. Eventually, the male victims may be very vague in explaining their injuries when they're seeking medical or mental health services.[4]

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PREVALENCE OF MSM IN INDIA

MSM are men who have sex with other men. Not all MSM see themselves as homosexual. Many such men may be married, have children and have sex with women; the fact that they have sex with men often remains hidden within their communities. Many have a 'masculine' gender identity and cannot be identified as being MSM by their dress, mannerisms or social roles and they may see themselves as being heterosexual. [5] Recent publications are starting to contribute to our understanding of this diverse group of men who do not consider themselves as gay or homosexual but who have sex with men. In addition to their having sex with women, these MSM may have sex with men on a regular or occasional basis, either secretly or openly. [6] Some MSM identify as gay. The term 'gay' is often associated with a more Westernised (Eurocentric/American) gay culture. The term gay-identifying men refers to men who see themselves as gay in terms of sexual orientation and identity, as well as cultural and social issues related to being gay in a predominantly heterosexual society. Within the broad group of gay-identifying males, there is diversity – in terms of dress, language, values, attitudes, sexual preferences and interests. These different groups

are known as sub-groups, sub-sets or sub-cultures. Some MSM have sex with other men on an occasional basis and may also have sex with women, while other MSM only have sex with other men. [7] In summary, the diverse collective of men included in the term MSM are men who are heterosexual, bisexual or homosexual and who can be either relatively masculine or effeminate in their dress and mannerisms. [8]

Sexual interactions between men include a range of behaviours such as kissing, hugging, masturbation, mutual masturbation, oral sex (fellatio), anal stimulation (digital or oral – oral is known as anilingus or 'rimming') or penile-anal penetration. Some men prefer not to engage in penetrative anal sex and may prefer 'thigh sex' (rubbing the penis between a partner's thighs). Some MSM may have a preference for being the more active (penetrative) partner during oral or anal sex, while other men may prefer the more passive (receptive) role, although many men may not have a preference. Importantly, not all MSM engage in anal sex. There are many variations and preferences in sexual activity. [9]

According to American academy of pediatrics,sexual orientation is not determined by any one factor but by a combination of genetic, hormonal and environmental factors. Homosexuality, the time old sexual perversion is practiced all over the world, with no restriction of age involving children and old subjects equally. This form of homosexuality may result in violence of any extent. In ancient India, homosexuality was stigmatized as inferior activity, but never persecuted. The term homosexuality is derived from Greek prefix "homo"- which means same and the Latin root "sex"- which means sex. The term "gay" is used mostly to refer to self-identified homosexual people of either sex. Lesbian is a gender specific term that is used for self-identified homosexual females. The Greeks of "Golden age" also practiced sodomy and therefore it is sometimes referred as 'Greek love'. [10]

The new urban pattern draws a sharp line between homosexuality and heterosexuality and interprets any sign of affection between persons of same sex as a sign of homosexuality. [11] A gay activist described homosexuality as need for men, who are twice as manly and capable of satisfying their women and then have sex with other men. [12] The rape of males in India is commonly reported; some claim that this prevalence means this form of rape cannot be an anomaly.[13]

A study done by Manisha Sharma et al. (2011) revealed that , maximum no of active agents(accused) were in the age group 15-20 years (32.61%) i.e. the age with high sexual activity, whereas the victims were most commonly in the age group 5-10 years (50%), which is the age, when children are more mobile, innocent and have no knowledge of sexual activity, leading to their victimization. Minimum age of active agent at which the offence was done was 10years. This can be presumed that sexual activity starts at this age. 13.04% accused were found to be bisexual i.e. they were married but still went for homosexual crime.

In contrast the crime related to homosexual behavior in this study was observed to be in lower class in 63.04% cases and in 36.96% cases, it involved lower middle class. Illiteracy of the accused (45.65% cases) could be one of the reasons of ignorance about the law and outcome of the crime like sodomy associated with abnormal sexual behavior. Rests of the accused were also having lower educational qualification. 13.04% accused were found to be bisexual i.e. they were married but still went for homosexual crime. [14]

Habitual passive agent with lax anal sphincter, anus lying at the bottom of a funnel shaped depression with surrounding skin thickened and glazed, as is mentioned by Bernard. [15]

The Family relationships existing in our society are largely responsible for the emotional disturbances which develop in early childhood and which in many cases lead to violent sexual and anti-social behavior at adolescence[16]

According to behaviorist theory, a boy exposed to a homosexual role model may be swayed towards becoming gay. A variation in both heterosexual and homosexual orientations results from social expectations. From a medical standpoint, homosexual crimes like sodomy are loaded with health dangers, including infections, bleeding and disease transmission problems. While promiscuity among heterosexuals also carries many dangers, they are generally far less than sodomy, and infections from sexual relations are actually relatively rare in monogamous couples who practice appropriate hygiene. A major reason this is true is that numerous genital secretions produce high levels of germicides which minimize enormously the chances of infection from heterosexual relations. On the other hand, no such secretions are produced for sodomy relations. [17]

PUNISHMENT

The Indian Penal Code, Section 377, is the only section that criminalizes all acts of nonconsensual carnal intercourse, including male-on-male rape. "Unnatural offences: Whoever voluntarily has carnal intercourse against the order of nature with any man, woman or animal, shall be punished with imprisonment for life, or with imprisonment of either description for term which may extend to ten years, and shall also be liable to fine. Explanation: Penetration is sufficient to constitute the carnal intercourse necessary to the offense described in this section." This section penalizes both consensual and forced sodomy with 10 years minimum to life imprisonment. The Delhi HC stated that Section 377 of Indian Penal Code will continue to govern non-consensual penile, non-vaginal sex and penile non-vaginal sex involving minors. The section can be evoked to punish sodomites, pedophiles and zoophiles.[18]

The rape definition in Section 375 of Indian Penal Code does not include rape in which males are the victims. The Indian government (2012) decided to change the definition of "rape" as forcible penetration to include male victims, but was criticized on the grounds that this would further harm the interests of female rape victims. [19]

In the 2013 Criminal Law (Amendment) Ordinance, rape and sexual harassment crimes were gender neutral. The term "rape" was removed and substituted with "sexual assault". But strong objections were raised by feminist groups that made the Indian government decided to restore the term rape and state that only men can be the rapists of women. [20]

CONCLUSION

It is noted that unnatural sex offences constitutes anal intercourse done against the will, with a man, woman or animal and shall be punished under section 377 IPC with imprisonment for life as a maximum punishment. No society, culture, country, religion tolerates unnatural sexual offence yet prevalence of sodomy is mentioned in arts, paintings and literature. Environmental factors illiteracy, poor socioeconomic status, age etc. play an important role in determining the sexual behavior of an individual leading to criminal activity. All the victims who had suffered the physical and mental trauma as a result of abnormal sexual activity of the accused were already familiar with the accused.

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REFERENCES

1. Coxell A, King M, Mezey G, Gordon D; King; Mezey; Gordon (1999). "Lifetime Prevalence, characteristics, and associated problems of non-consensual sex in men".BMJ. 318 (7187): 846–50. doi:10.1136/bmj.318.7187.846. PMC 27803. PMID 10092264.
2. Rabin, Roni Caryn (23 January 2012). "Men Struggle for Rape Awareness". The New York Times. Retrieved30 November 2013.
3. Deborah Condon. April 4th 2014. Irish Health. Male rape 'still a taboo subject'. Comments of Dr Maeve Eogan and Deirdra Richardson in Modern Medicine, the Irish Journal of Clinical Medicine.
4. Richard Tewksbury. Department of Justice Administration, University of Louisville. Effects on Sexual Assaults on Men: Physical, Mental and Sexual Consequences. International Journal of Men's Health, Vol 6, No 1, Spring 2007.
5. Ahmad S, Bansal R, Maroof KA, Parashar P. Awareness Of HIV/AIDS Among Young Adults Of An Urban & Rural Area Of Meerut District: A field study. International Journal of Essential Sciences. 2008; Vol. 02, No. 0I . Page no.64-67. (ISSN: 0973-8436)
6. Ahmad S, Goel K , Maroof KA, Goel P, Gurmeet K, Abid. Pattern of sexual practices amongst men who have sex with men and awareness about HIV/AIDS in Meerut. International Journal of Contemporary Medicine. Jan-June 2013; Vol. 1, No.01. Page no. 58-62. (ISSN: 2320-9623) Index Copernicus Value (2015) :84.90
7. Ahmad S , Saurabh Sharma, Manoj K.Tripathi, Arvind K. Shukla, Akhtar Ali, Manish Garg. Health risk factors in MSM due to unnatural sexual practices and its reasons. International Journal of Contemporary Microbiology. Jan- June 2015; Vol.01, No.01.Page no.58-62. (ISSN: 2394-9473)
8. Ahmad S, Arvind K. Shukla, Saurabh Sharma, Bhawana Pant , Manoj K Tripathi. A Review Study on Socio-cultural Reasons and Risk of Infectious

Diseases among Males Who Have Sexual Engaged with Males. International Journal of Contemporary Microbiology. July-December 2015; Vol.01, No.02. Page no.13-17 (ISSN: 2394-9473)

9. Ahmad S, Arvind K. Shukla. Understanding Male Homosexual Abuse as a Predictor Of Sexual Transmitted Diseases. International Journal of Contemporary Microbiology. January-June 2016; Vol.02, No. 01. Page no. 34-38. (ISSN: 2394-9473)
10. Guharaj PV, Chandran MR. Sodomy in Forensic medicine. 2nd Ed. Chennai: Orient longman pvt ltd; 2003. p 216.
11. Rydstrom J. From Sodomy to Homosexuality: Rural sex and the inclusion of Lesbians in criminal discourse. NORA.2005; 13(1):20-35.
12. Kadu SS, Jondhale PS, Hompe M.Homosexuality-A socio-medicolegal study. Indmedica. 2008; 8(2):
13. Jai Vipra. July 2013. CCS working Paper #286, A Case for Gender-Neutral Rape Laws in India.
14. Maneesha Sharma, Dr. KK Aggarwal, Dr. RK Gorea, Abnormal Sexual Behaviour - A Study Of Social Factors. J Punjab Acad Forensic Med Toxicol 2011; 11(1)
15. Knight B. Sodomy in Lawyer's guide to Forensic Medicine.;2nd Ed. London: 204 Cavendish publishing ltd glasshouse,Wharton street,, UK; 1998.
16. Cowley J. Youth in a Delinquent Society.fourth International, Fall 1955:111-119.
17. Bergman J. Creationism and problems of Homosexual behaviour.TJJr of creation. 1995; 9(1):121-130.
18. Meghna. 13 May 2010. Male Rapes – Some Myths, Statistics, True Incidents and Legal Insight.
19. Mahendra Kumar Singh & Vishwa Mohan. July 19, 2012. The Times of India, Government looks to make rape laws gender-neutral.
20. Nagendar Sharma. March 05, 2013. Hindustan Times,Only men can be booked for rape.

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The Sociological Study of Sexual Behaviors and Situational Characteristics of Most Recent Male-Partnered Sexual Event among Gay Peoples and Related Health Risks Issues

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ABSTRACT

Men who have sex with men called Gay and who engage in sexual activity with same sex. Worldwide, at least 3% of men, and perhaps as high as 16% of men, have had sex at least once with a man. HIV infection and other diseases including Acquired Immune Deficiency Syndrome (AIDS) are a challenging illness which are generally transmitted through unsafe sexual practices among gay around the world including India.

Keywords: *MSM, unsafe sexual practices, people, health risks issues*

INTRODUCTION

Men who have sex with men and who engage in sexual activity with members of the same sex. [1] It is caused by genetic and social factors only, not moral or religious factors. [2] A behavior survey on MSM found in India 12 to 38 million, had male-to-male sex in their lifetime. Many of these males are ritually fully castrated as a religious sacrifice (penis and testicles removed–an illegal act in these countries), and they will describe themselves as neither male nor female but as "other." [3] People of all sexual orientations and partners of all genders have anal sex. Fellatio is a much more common practice among gay men.[4] Worldwide, an estimated 5–10% of HIV infections are the result of men having sex with men. [5]

Sex between men is like sex between men and women–it is learned, not instinctive, and is of great variety and meaning. Sex is a way of expressing feelings and connecting with others. It can provide warm feelings of intimacy, tenderness, love and trust or be strongly passionate.

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Gay is a way of expressing feelings, fun and pleasure, have orgasm, human nature, love, and connecting with others. Teen age boys, students living in hostels, young unmarried males, adult men in single institutions, migrant men, strangers, prisoners, closed relatives, friends, or men living away from their wives, tea shop boys, restaurant boys, hotel boys, truck drivers, taxi drivers, rickshaw drivers, business men, and military personnel are the most common category of male-to-male sexual behavior because males are easier to access shared beds easily._Some men who have sex with men, however, believe that being a receptive partner during anal sex questions their masculinity. MSM have sex for money, gifts or rewards. Married men also prefer sex with men because anus is tighter and gives more pleasure than natural sex. [6] The intimacy, intensity, and ecstasy of anal pleasure can sometimes be overwhelming, but it can also be very special and extremely satisfying. The *New* Good *Vibrations* Guide to Sex reminds us that "the anus is rich in nerve endings and participates with our genitals in the engorgement, muscular tension and contractions of sexual arousal and orgasm." [7]

Gay sexual practices are sexual activities involving men who have sex with men(MSM), regardless of their sexual orientation or sexual identity. The authors of the Kinsey Reports state that 37% of their male subjects had at least one homosexual experience. [8]

Historically, anal sex has been popularly associated with male homosexuality and MSM. Many MSM, however, do not engage in anal sex, and may engage in oral sex, frottage or frot, or mutual masturbation instead. [9] MSM may also engage in different forms of oral sex, such as fellatio, tea bagging, and anilingus. Wellings et al. reported that "the equation of 'homosexual' with 'anal' sex among men is common among lay and health professionals alike," whereas an online survey of 18,000 MSM in Europe «showed that oral sex was most commonly practised, followed by mutual masturbation, with anal intercourse in third place." [10] A 2011 survey by *The Journal of Sexual Medicine* found similar results for U.S. gay and bisexual men. Kissing a partner on the mouth (74.5%), oral sex (72.7%), and partnered masturbation (68.4%) were the three most common behaviors, with 63.2% of the sample self-reporting five to nine different sexual behaviors during their last encounter. [11]

Among men who have anal sex with other men, the insertive partner may be referred to as the *top*, the one being penetrated may be referred to as the *bottom*, and those who enjoy either role may be referred to as *versatile*. [12] Pleasure, pain, or both may accompany anal sex. While the nerve endings in the anus can provide pleasurable feelings, an orgasm may be achieved through receptive anal penetration by indirect stimulation of the prostate. [13]

A study by the National Survey of Sexual Health and Behavior (NSSHB) indicated that men who self-report taking a receptive position during anal sex in their last encounter were at least as likely to have reached orgasm as men who adopted an insertive role. [14]

People of all sexual orientations and partners of all genders have anal sex. With regard to pain or being uncomfortable during anal sex,[15] some research indicates that, for 24% to 61% of gay or bisexual men, painful receptive anal sex (known as anodyspareunia) is a frequent lifetime sexual difficulty.[16]

In a large sample (n = ~25,000) of U.S. gay and bisexual men, about 86% of those who bottomed in their last sexual encounter described the penetration in that event as being a little or not at all painful; around 5% described it as extremely or quite a bit painful. [17] A large percentage of gay and bisexual men self-report lifetime participation in anal sex. [18] A Study among gay men have indicated that percentages are similar when comparing men who prefer to penetrate their partners to those who prefer to be the receptive partner. [19]

HEALTH RISKS

HIV infection and other diseases among MSM have been increasing in recent years around the world, including India. Acquired Immune Deficiency Syndrome (AIDS) is a challenging illness caused by the HIV virus, which is generally transmitted through unsafe homosexuality. [20]

A 2007 study reported that two large population surveys found "the majority of gay men had similar numbers of unprotected sexual partners annually as straight men and women."[21] . However, in most of the Western world, more HIV infections are transmitted by men having sex with men than by any other transmission route [22] . In the United States, gay and bisexual men accounted for 54% of HIV/AIDS cases and 67% of new diagnoses in 2014. [23] .

Syphilis is passed from person to person through direct contact with a syphilis sore; mainly on the external genitals, the vagina, or anus. In 2006, 64% of the reported cases in the United States were among men who have sex with men. [24] . A rise in the incidence of syphilis among MSM has been seen in other developed nations. Contracting syphilis increases the rates of HIV contamination and vice versa, and accordingly a survey in the US has indeed found that half MSM with syphilis also possess HIV.[25] .

Some studies utilizing convenience samples have concluded that such rise can be attributed to increased rates of sex without a condom among MSM,[26] though at least one study using a nationally representative sample has found that condom use rates among MSM have increased, not decreased, in the last decade, and there has been a steep decline in the frequency of anal sex in the last sexual encounter of active MSM.[27] .

According to a US survey, HIV, syphilis, and anal warts are both significantly more common among men who recently had sex with men (MSM) than among men who recently had sex only with women (MSW). On the other hand, genital herpes is less common among MSM than among MSW. [28] .

Anal health issues

If the perianal skin, anus, anal canal and rectum are involved in sexual activity, care is necessary. Damage to the internal or external skin and tissue of the anus can affect health, cause pain and impair function. Anal problems can manifest as lumps, ulcers, rashes, discharge, bleeding or difficulties with defecation. Common conditions of the anorectal region and perianal skin are hemorrhoids, anal fissures and conditions causing itching such as dermatitis, fungal and parasitic infections, skin disorders, allergic reactions and poor anal hygiene.

STIs affecting the anus or rectum usually have no symptoms or poorly defined symptoms that can mimic other common conditions. Because anal and rectal tissue is delicate and easily torn, viruses can be easily transmitted through the tissue into the bloodstream; so, unprotected anal intercourse with an infected person is a high-risk activity for both partners—statistically higher than vaginal intercourse with an infected person—for all STDs, including HIV.

Unprotected oral-anal contact and digital penetration also puts both partners at risk—the receiver because of fragile rectal tissue and the giver because of cuts or sores that may be on the hands or mouth.

Penile health issues

The penis functions both as the outlet of the urinary tract and as a sexual and reproductive organ. Both semen and urine pass through the penile urethra. The erectile function of the penis is produced by the engorgement of venous plexuses within the corpus cavernosum and the corpus spongiosum. The penis can become erect in response to erotic stimuli as well as direct physical stimulation. Erectile function can be adversely affected by psychological issues such as anxiety and by physical conditions affecting the nerve and blood supply to the penis. STIs affecting the penis include gonococcal and chlamydial infections of the urethra. These typically manifest as urethral discharge or dysuria. Recent improvements to diagnostic technology (e.g., polymerase chain reaction–PCR testing) have demonstrated that many more urethral infections are asymptomatic than previously appreciated. Other infections that can affect the skin of the penis include genital ulcer diseases (e.g., syphilis, chancroid and herpes) and human papilloma virus (HPV), which can cause ano-genital warts and occasionally anogenital cancer.

The presence of the foreskin in uncircumcised men creates an environment in which pathogenic organisms including those sexually acquired can thrive. Poor hygiene increases the risk that infections can occur beneath the foreskin.

Scrotal health issues

Scrotum is the soft bag of skin that contains the pair of testes (testicles). The testes are the organs that produce the sperm contained in semen. The testes also produce the sex hormone testosterone. Normally, the testes are smooth, egg-shaped organs and relative mobile in the scrotum. During sexual arousal or when exposed to cold, the muscle surrounding the spermatic cord and testes contracts and pull the testes close to the body. Although rare, testicular cancer occurs mostly in young men (aged 15-35 years) and is generally curable if diagnosed early. Encouraging men to examine their testicles for unusual swelling or lumps on a regular basis is a good way to detect early abnormalities that might suggest a tumor.

Prostate health issues

Men can experience stimulation of the prostate gland when they are anally penetrated. The prostate gland is the gland that produces semen, and it can be a big source of pleasure for men when they receive anal penetration. It is very sensitive to massage, and most men prefer gentle rubbing; any jerky movement or poking can be very uncomfortable. The prostate produces a significant proportion of the fluid in semen. Stimulation of the prostate during anal sexual activity is pleasurable for many men. In later life, the prostate can become enlarged and limit the flow of urine from the bladder. This can be corrected through surgery. Prostatic cancer is a disease of older men and can be detected through routine skilled rectal [29] .

Law as Section 377 of the Indian Penal Code

Section 377 of the Indian Penal Code, a post-colonial British legacy, criminalizes consensual sex between adult males. Though this law has not been broadly enforced in a direct manner, the criminality of same-sex sexual behaviour indirectly supports Gay, MSM and *hijras* being subjected to physical and sexual violence, blackmail and extortion of money by the police, and aggressive, violent and often young criminals.Several

sources document that peer educators and outreach workers involved in HIV prevention services for MSM have been harassed by the police.

In 2001, Naz Foundation (India) Trust, through the Lawyers Collective, filed a public interest litigation (PIL) in the Delhi High Court to decriminalize adult consensual same sex relationships. Relying on Constitutional law, the petition asked for a "reading down" of Section 377 (making section 377 not applicable in the context of consensual sex between same-sex adults) of the Indian Penal Code, as it posed a structural barrier to conducting outreach to MSM with HIV prevention and treatment services.

In July 2009, the Delhi High Court ruled that consensual same-sex relations between adults in private cannot be criminalized. Soon after that judgment, appeals were lodged in the Indian Supreme Court objecting to the ruling. Besides legal issues, MSM and TG face various forms of stigma and discrimination from their families, society and in health-care settings.[30]

CONCLUSION

Same-sex behaviour is identified in all societies, irrespective of whether same-sex sexuality is openly acknowledged, not talked about, or actively denied. To ensure that the MSM and TG population have improved access to HIV and care services requires addressing the legal barriers that interfere with HIV prevention, treatment and care. Punitive laws and law enforcement practices exist in the vast majority of countries in the Region, and this has contributed towards low coverage of HIV services, and further marginalized the MSM and TG population.

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REFERENCES

1. Ahmad S, et al. (2013). Pattern of sexual practices amongst men who have sex with men and awareness about HIV/AIDS in Meerut. International Journal of Contemporary Medicine. Jan-June 2013; Vol. 1, No.1. Page no. 58-62 .
2. Samuel S. Janus and Cynthia L. Janus, The Janus Report on Sexual Behavior (New York: John Wiley & Sons, 1993), 105.
3. Ahmad S, et al. (2008) Awareness Of HIV/AIDS Among Young Adults Of An Urban & Rural Area Of Meerut District: A Field Study. International Journal of Essential Sciences. 2008; Vol. 02, No. 0I. Page no.64-67.
4. Morin, Anal Pleasure, 9 and Reinisch, Kinsey New Report, 137.
5. Men who have sex with men (MSM) and HIV/AIDS | AVERT". avert.org. Retrieved February 10, 2015.
6. Ahmad S, et al. (2016) Understanding Male Homosexual Abuse as a Predictor of Sexual Transmitted Diseases. International Journal of Contemporary Microbiology. January-June 2016; Vol.2, No. 1. Page no. 34-38.
7. Cathy Winks and Anne Semans, The New Good Vibrations Guide to Sex (San Francisco: Cleis Press, 1997), 128.
8. Sexual Behavior in the Human Male, p. 656
9. Edwin Clark Johnson, Toby Johnson *(2008)*. Gay Perspective: Things Our Homosexuality Tells Us about the Nature of God & the Universe. Lethe Press. p. 139.ISBN 978-1-59021-015-4. Retrieved February 12, 2011.
10. Kaye Wellings; Kirstin Mitchell; Martine Collumbien (2012). Sexual Health: A Public Health Perspective. McGraw-Hill International. p. 91. ISBN 0335244815. Retrieved August 29, 2013
11. Sexual Behaviors and Situational Characteristics of Most Recent Male-Partnered Sexual Event among Gay and Bisexually Identified Men in the United Statesonlinelibrary.wiley.com Retrieved 2-13-2014
12. Steven Gregory Underwood (2003). Gay Men and Anal Eroticism: Tops, Bottoms, and Versatiles. Harrington Park Press. ISBN 978-1-56023-375-6. RetrievedFebruary 12, 2011.
13. Komisaruk, Barry R.; Whipple, Beverly; Nasserzadeh, Sara; Beyer-Flores, Carlos (2009). The Orgasm Answer Guide. JHU Press. pp. 108–109. ISBN 0-8018-9396-8. Retrieved November 6, 2011.
14. Mona Chalabi *(20 August 2015)*. "The Gender

Orgasm Gap". Five Thirty Eight.

15. Morin, Anal Pleasure, 9 and Reinisch, Kinsey New Report, 137.
16. Joel J. Heidelbaugh (2007). Clinical men's health: evidence in practice. Elsevier Health Sciences. p. 273.ISBN 978-1-4160-3000-3. Retrieved October 14, 2011.
17. Joshua G. Rosenberger; et al. (2011). "Sexual Behaviors and Situational Characteristics of Most Recent Male-Partnered Sexual Event among Gay and Bisexually Identified Men in the United States". *J Sex Med.* 8: 3040–3050. doi:10.1111/j.1743-6109.2011.02438.x.
18. Steven Gregory Underwood (2003). Gay Men and Anal Eroticism: Tops, Bottoms, and Versatiles. Harrington Park Press. ISBN 978-1-56023-375-6. RetrievedFebruary 12, 2011.
19. The Impact of Sexual Orientation on Sexuality and Sexual Practices in North American Medical Students".Journal of Sexual Medicine. 2010. doi:10.1111/j.1743-6109.2010.01794.
20. Goel K, Ahmad S, et al. (2014) A community based study on awareness of HIV/AIDS among young males of Meerut, UP. International Journal of Contemporary Medicine .Jan-June 2014; Vol. 02, No.01. Page no. 85-89.
21. Goodreau SM, Golden MR (October 2007). "Biological and demographic causes of high HIV and sexually transmitted disease prevalence in men who have sex with men". *Sex* Transm Infect. 83 *(6): 458–462.*doi:10.1136/sti.2007.025627. PMC 2598698.PMID 17855487.
22. "2009 AIDS epidemic update". Joint United Nations Programme on HIV/AIDS and World Health Organization. November 2009. Archived from the original *on September 28, 2011.* Retrieved September 28, 2011.
23. Center for Disease Control (CDC) (2016-08-12). "Gay and Bisexual Men | HIV by Group | HIV/AIDS | CDC". cdc.gov. Retrieved August 21, 2016.
24. Syphilis & MSM (Men Who Have Sex With Men) – CDC Fact Sheet, Centers for Disease Control and Prevention
25. Reported STDs in the United States — 2014 National Data for Chlamydia, Gonorrhea, and Syphilis" *(PDF).*
26. M Hourihan; H Wheeler; R Houghton; B T Goh (2004)."Lessons from the syphilis outbreak in homosexual men in east London". *Sex* Transm Infect. 80 *(6): 509–511.*doi:10.1136/sti.2004.011023. PMC 1744940. PMID 15572625.
27. Andrew E. Grulich; et al. (2014). "Homosexual experience and recent homosexual encounters: the Second Australian Study of Health and Relationships". Sexual Health. 11 *(5): 439–50.* doi:10.1071/SH14122.
28. Thomas W. Gaither; et al. (2015). "The Influence of Sexual Orientation and Sexual Role on Male Grooming-Related Injuries and Infections". *J Sex Med.* 12 *(3): 631–640.* doi:10.1111/jsm.12780.
29. Ahmad S , Arvind Kumar Shukla, Prevents the Transmission of STIs Including Enteric Pathogens among MSM and Transgender Peoples. International Journal of Contemporary Microbiology, January -June 2017, Vol.3, No. 1. Page no.1-5
30. World Health Organization 2010

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Drug Resistance Patterns in Known MDR TB Cases from Gujarat, India

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ABSTRACT

Background: Tuberculosis (TB) is a major threat to world health. A major obstacle to control TB is the emergence of mycobacterial resistance to anti-tuberculous chemotherapy.

Materials and Method: Total 145 MDR isolates were included in this study to determine the DST of 1st and 2nd line agents (levofloxacin 1.5, moxifloxacin 2.0, kanamycin 2.5 and capreomycin 2.5, ethambutol 5.0, ethionamide 5.0, PAS 4.0, clofazamine 1.0, linezolid 1.0 & pyrazinamaide 100) by MGIT 960.

Results: 13.7% isolates were sensitive to all 10 drugs. Fluroquinolone (levofloxacin 1.5 & moxifloxacin 2.0) resistance was 11.7%, Aminoglycoside resistant (kanamycin 2.5 and capreomycin 2.5) resistance was 6.2%. 2.7% isolates were XDR. One MDR isolate was resistant to all studied drugs.

Conclusion: Due to emergence of resistance to 2nd line drugs, there is a need of DST guided treatment in order to develop efficient regimens for appropriate treatment of individual cases.

Keywords: *MDR, XDR, MGIT,1st line DST, 2nd line DST*

INTRODUCTION

Tuberculosis (TB) – an infectious airborne disease – is a major global health problem. Each year, there are around nine million new cases of TB, and close to two million deaths. All countries are affected, but 85% of cases occur in Africa (30%) and Asia (55%), while India and China alone represent 35%.[1] Treatment of multidrug-resistant TB (MDR-TB) [2] – there are around 0.5 million cases each year[2] – is more challenging, requiring the use of second-line drugs that are more costly, cause more severe side effects, and must be taken for up to two years. Cure rates for MDR-TB are lower, typically ranging from 50% to 70%.

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Multidrug-resistant TB and extensively drug-resistant TB (MDR-TB and XDR-TB) are major threats to TB control, with all countries at risk. MDR-TB is defined as resistance to isoniazid(INH) and rifampicin (RIF), the two most important first-line drugs that are used in the treatment of TB. XDR-TB is defined as MDR-TB plus resistance to additional drugs - a fluoroquinolone and, at least, one second-line injectable drug. [3] WHO estimates that in 2008, 4,40,000 MDR-TB cases emerged and 1,50,000 deaths were caused by MDR-TB. [3] As of August 2010, 59 countries had reported at least one case of XDR-TB.

Frequency of MDR-TB is less than 3% in new cases and 12-50% among retreatment cases as per the recent studies, and this is on rise. [4]

Conventional diagnosis of drug-resistance in *M. tuberculosis* strains relies heavily upon mycobacterial culture and drug susceptibility testing in liquid or solid media. While this method is effective for detecting INH and RIF resistance, detecting resistance to AMK(amikacin), KAN(kanamycin) and/or CAP(capreomycin) is more

complicated and less reliable [5].

Appropriate use of the ‘‘second-line’’ injectable drugs, AMK, KAN and/or CAP is critical to the effective treatment of MDRTB and to the prevention of XDR-TB. It is therefore imperative that the MDR-TB strains in patients starting second-line drug treatment are first tested for sensitivity to these drugs to ensure appropriate treatment choices are made and that resistance is not further amplified [6].

SUBJECTS AND METHOD

To determine, 10 drugs (1st and 2nd lines) susceptibility, 145 MDR isolates were included in this study. All these smear positive samples were processed by LPA (MTBDRplus, HAIN Life science, bioMerieux) to determine INH and rifampicin resistance. [7]

Pair of fresh sputum samples (one early morning and another spot) was collected from MDR patients. Liquid culture was done by using BACTEC MGIT 960 System (Becton, Dickison and company, US).

Sample processing:

Digestion, decontamination and concentration of sputum samples were done by NAOH-N-Acetyl L-Cysteine(NALC) Method [8]

A BBL MGIT tube (from Becton Dickinson) containing 7 ml modified middle brook 7H9 broth was used. Lyophilized MGIT PANTA (containing polymyxin B, azlocillin, nalidixic acid, trimethoprim, amphotericin B) was reconstituted with MGIT growth supplement (containing oleic acid, albumin, dextrose, catalase, polyoxyethylene stearate), and 0.8 ml of this was added prior to sample inoculation to the MGIT960 tube. MGIT tubes were incubated inside the MGIT960 instrument for 6 weeks. Smears were made from MGIT-positive culture tubes as well as from MGIT negative tubes that had some deposit in them, to confirm the presence or absence of *Mycobacteria*, as per the protocol of Becton Dickinson. *M. tuberculosis* has serpentine cord like arrangement in ZN stain. A loopful of the culture is streaked on blood agar to rule out contamination. Plate was observed at 24 and 48 hours of incubation. MPB64 immunochromatic assay (SD Bioline) was use to confirm positive MGIT culture. [8]

DST procedure for MGIT 960:

All drugs were in pure powder form obtained from Sigma-Aldrich (St.Louis,MO) or from Becton Dickinson**.** The powders were stored at −20^{0}C in desiccators as recommended by the manufacturer All stock solutions were sterilized by membrane filtration through 0.22μm-pore-size Millex-GS filter units (Millipore, Bedford, MA). All stock solutions were stored at −80^{o}C in small aliquots. The frozen drug solutions were used immediately after thawing and the remaining was discarded. Working solution was prepared freshly from stock solution and serial dilutions were carried out to achieve the desired concentrations.

Susceptibility testing was performed according to the protocol provided by the manufacturer. Tubes were prepared by adding 0.5 ml of MGIT OADC enrichment (Becton Dickinson) and 0.5 ml of a 1:5 dilution (with sterile saline) of the inoculums prepared as per the 3-5 days protocol. For each sample, drug containing MGIT tube and one growth control (GC) tube without drug were inoculated.

The tubes were loaded in MGIT 960 and incubated at 37°C and were examined daily for fluorescence with a 365-nm Wavelength light by MGIT. The results were interpreted only after the growth control tube fluoresced

Quality control:

Strict Quality control was maintained as per the manufacturer protocol by using ATCC H37RV.

RESULTS

A total, 145 patients with confirmed MDR TB were studied. 143 were sputum samples and 2 were extra pulmonary samples (1 pleural fluid and 1 pus). These patients were from various districts of Gujarat. 2% MDR isolates has low level of resistant to Isoniazid. All these isolates were also resistant to ethionamide. The resistance pattern has been summarized in Table 3 and figure 1. Among 10 drugs tested clofazimine showed maximum resistant while linezolid was least resistant.

Table 1: Details of Antibiotic used in DST

Sr. No	Name of the Drug	Company	Required concentration (µg/ml)	Diluent	Number of times the stock should be diluted
1	Levofloxacin	Sigma	1.5	0.1 N NaOH	100
2	Moxifloxacin	Sigma	2.0	0.1 N NaOH	100
3	Kanamycin	Sigma	2.5	Distilled water	1000
4	Capreomycin	Sigma	2.5	Distilled water	100
5	Linezolid	Sigma	1.0	Distilled water	10
6	Clofazimine	Sigma	1.0	Dimethyl formamide	100
7	Ethionamide	Sigma	5.0	Triethylene glycol	-
8	Ethambutol	BD	5.0	Distilled water	-
9	Para amino salicyclic acid(PAS)	Sigma	4.0	Dimethyl formamide	100
10	Pyrazinamide	BD	100	Distilled water	-

Table 2: Details of Susceptibility of 145 MDR isolates to 10 drugs

Sr. No	Name of the Drug	Critical concentration	Sensitive	Resistant	Percentage of resistance
1	Pyrazinamide	100	89	56	38.6%
2	Levofloxacin	1.5	77	68	46.8%
3	Moxifloxacin	2	128	17	11.7%
4	Kanamycin	2.5	128	17	11.7%
5	Capreomycin	2.5	134	11	7.5%
6	Linezolid	1.0	143	2	1.3%
7	Ethionamide	5.0	90	55	37.9%
8	Ethambutol	5.0	82	63	43.4%
9	Para amino salicyclic acid (PAS)	4.0	123	22	15.1%
10	Clofazimine	1.0	66	79	54.4%

Table 3. Various resistance patterns seen in the study sample

Sr. No.	Pattern of Resistance	No & Percentage
1	Fluroquinolone resistant (levofloxacin and moxifloxacin)	17(11.7%)
2	Aminoglycoside resistant (kanamycin and capreomycin)	9(6.2%)
3	XDR	4(2.7%)
4	ethambutol & ethionamide resistant	33(22.7%)
5	ethambutol, ethionamide & PAS resistant	8(5.5%)
6	ethambutol, ethionamide, PAS & clofazamine resistant	7(4.8%)
7	ethambutol, ethionamide, PAS, clofazamine & pyrazinamaide resistant	5(3.4%)

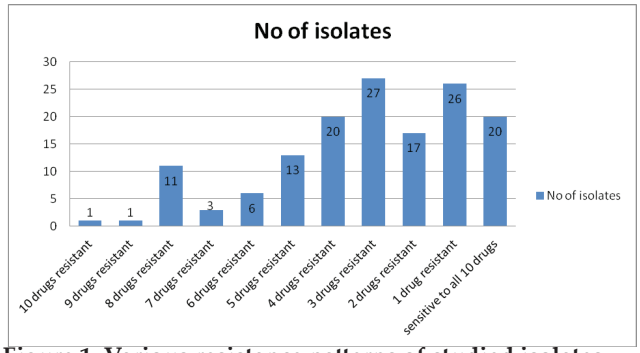

Figure 1. Various resistance patterns of studied isolates

DISCUSSION

A mere diagnosis of MDR and initiation of second-line ATT without proper regimens based on DST may not help achieve a good treatment outcome. As there is an increasing trend of MDR in India, proper formulation of treatment regimens consisting of newer drugs based on various drug resistance patterns in confirmed MDR cases is very much required as evident from the present study.

The recommended number of drugs used to treat MDR-TB is a subject of controversy. The ATS recommend four to six drugs for the treatment of MDR-TB.[9] The WHO however recommends at least four drugs.[10] The consensus is that more drugs may be required for more serious patients with previous use of second-line drugs or whose DST profile is adverse.

The choice of these drugs is based on efficacy, adverse effects, cost, previous drug exposure, and susceptibility. An injectable second line drug (capreomycin/ kanamycin/ amikacin in that order), a newer fluoroquinolone (high dose levofloxacin/ moxifloxacin) along with the oral group 4 drugs (ethionamide, cycloserine and PAS in that order) are the recommended agents. The use of the category 5 drugs is recommended in only special situations (clofazimine, coamoxyclav, linezolid, meropenem, clarithromycin and thioacetazone in that order; each drug counted as half a drug). The guidelines also recommend addition of high dose isoniazid, pyrazinamide and a newer fluoroquinolone to the regime even if they are tested resistant (though they should not be counted).

Linezolid has emerged as a useful drug for treatment of MDR TB with good in vitro susceptibility. [11] Similar results were observed from our study. linezolid resistance (1.3%) was least among all 2nd line drugs.

Widespread and indiscriminate use contributes to emergence of fluoroquinolone-resistant TB. [12] Fluoroquinolone resistance in MDR-TB is an emerging problem globally. [13] and has recently been reported from our centre in India. [15] The indiscriminate use of fluoroquinolones needs to be checked to control the spread of MDR-TB and XDR-TB. [14]

Compared to other 2nd line drugs, resistance in aminoglycosides is less, hence use of aminoglycosides has also been recommended as an injectable therapy.

A study from Tuberculosis Research Centre, Chennai reported that of the 1498 strains of MDR tuberculosis isolated between 2001-2004 from all across India, 44.8% were resistant to ≥ second line drug (SLD). Prevalence of ethionamide resistance was 32.7%, ofloxacin resistance 16.4% and kanamycin resistance 11.3%; 4.6% strains were XDR. [19] Udwadia et al have reported rise in FQ resistance in MTB isolates from 3% in 1996 to 35% in 2004. [14].

The actual incidence and prevalence rate of XDR-TB in India is not available. A few scattered reports: Mondal et al reported 7.4% of MDR strains as XDR [15]; a study from Hinduja Hospital, Mumbai revealed 11% of MDR strains as XDR [16]. Singh et al reported 33.3% of MDR TB cases as XDR-TB in a population of HIV sero-positive patients from AIIMS, New Delhi. [17] Sharma et al found 2.4% of MDR as XDR-TB cases from Delhi. [18] A study conducted by Paramasivan et al reported 4.6% XDR-TB cases in Chennai [19] and another recent study by Khanna et al from Delhi reported 5.76% XDR-TB. [20]

Among 10 drugs tested, maximum resistance was found in clofazimine, followed by levofloxacin, ethambutol, pyrazinamide, ethionamide, PAS, moxifloxacin, kanamycin, capreomycin and linezolid.

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REFERENCES

1. Global tuberculosis control 2010. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.7)
2. Multidrug and extensively drug-resistant TB (M/XDR-TB): 2010 global report on surveillance and response. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.3).
3. Multidrug and extensively drug-resistant TB (M/XDR-TB). 2010 global report on surveillance and response. Geneva, World Health Organization, 2010 (WHO/HTM/TB/2010.3).
4. Mahadev B, Kumar P, Agarwal SP, Chauhan LS, Srikantaramu N. Surveillance of drug resistance to antitubercular drugs in districts of Hoogly in West Bangal and Mayurbhanj in Orissa. Indian J Tuberc 2005;52:5-10.
5. Pfyffer GE, Bonato DA, Ebrahimzadeh A, Gross W, Hotaling J, et al. Multicenter laboratory validation of susceptibility testing of Mycobacterium tuberculosis against classical second-line and newer antimicrobial drugs by using the radiometric BACTEC 460 technique and the proportion method with solid media. J Clin Microbiol 1999;37:3179–86.
6. Calver AD, Falmer AA, Murray M, Strauss OJ, Streicher EM, et al. Emergence of increased resistance and extensively drug-resistant tuberculosis despite treatment adherence, South Africa. Emerg Infect Dis 2010;16:264–271.
7. HAIN LPA (MTBDRplusV2) manual available at https://www.ghdonline.org/uploads/MTBDRplusV2_0212_304A-02-02.pdf
8. MGIT procedure Manual available at www.finddx.org/wp-content/uploads/2016/02/mgit_manual_nov2006.pdf
9. Caminero JA, de March P. Statements of ATS, CDC, and IDSA on treatment of tuberculosis. Am J Respir Crit Care Med 2004;169:316-17.
10. World Health Organization. Treatment of tuberculosis: Guidelines for national programmes. 3rd ed. WHO/CDS/TB/2003. 313. Geneva, Switzerland: WHO; 2003.
11. Fortún J, Martín-Dávila P, Navas E, Pérez-Elías MJ, Cobo J, Tato M, et al. Linezolid for the treatment of multidrug-resistant tuberculosis. J Antimicrob Chemother 2005;56:180-85
12. Mohapatra PR. Fluoroquinolones in multidrug-resistant tuberculosis. Am J Respir Crit Care Med 2004;170:920-21.
13. Sullivan EA, Kreiswirth BN, Palumbo L, Kapur V, Musser JM, Ebrahimzadeh A, et al. Emergence of fluoroquinolone-resistant tuberculosis in New York City. Lancet 1995;345:1148-50.
14. Agrawal D, Udwadia ZF, Rodriguez C, Mehta A. Increasing incidence of fluoroquinolone-resistant Mycobacterium tuberculosis in Mumbai, India. Int J Tuberc Lung Dis 2009;13:79-83.
15. Mondal R, Jain A Extensively Drug-Resistant Mycobacterium tuberculosis, India. Emer Infectious Dis 2007;13:1429–31.
16. Ajbani K, Rodrigues C, Shenai S, Mehta A Can mutation detection accurately predict XDR- TB: study from a tertiary care centre India. J Clin Microbiol 2011;49:1588–90.
17. Singh S, Sankar MM, Gopinath K High rate of extensively drug- resistant tuberculosis in Indian AIDS patients. AIDS 2007;21:2345–47.
18. Sharma SK, George N, Kadhiravan T, Saha PK, Mishra HK, et al. Prevalence of extensively drug- resistant tuberculosis among patients with multidrug- resistant tuberculosis: a retrospective hospital-based study. Indian J Med Res 2009;392–395.
19. Paramasivan CN, Rehman F, Wares F, Sundar Mohan N, Sundar S, et al. First- and second-line drug resistance patterns among previously treated tuberculosis patients in India. Int J Tuberc Lung Dis 2010;14:243–246
20. Khanna A, Raj VS, Tarai B, Sood R, Pareek PK, et al. Emergence and Molecular Characterization of Extensively Drug-R Mycobacterium tuberculosis Clinical Isolates from the Delhi Region in India. Antimicrobial Agents and Chemotherapy 2010;54:4789–93.

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Utilization of Probiotics in Dental Caries and Periodontal Diseases

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ABSTRACT

Bacteria are the most common cause of caries, that can lead to pulpal involvement and eventually the tooth will need endodontic treatment if it must be saved. The complete elimination of bacteria is paramount to the success of root canal treatment. Retreatment of failed RCT is also a common scenario. The bacteria present in the failed endodontic cases are different form initial treatment cases. Also, the various irritants and procedures of cleaning and shaping are also important for complete elimination of the bacteria.

Keywords: *Probiotics Bacteria, Probiotics therapy. root canal ecology, Dental Caries, Periodontal Diseases*

INTRODUCTION

Probiotics have become popular during the last few decades as a result of the continuously expanding scientific evidence pointing to their beneficial effects on human health. So they have been applied as various products with the food industry having been very active in studying and promoting them. Within this market the Probiotics have been incorporated in various products, mainly fermented dairy foods. In present trend and despite the strong scientific evidence associating these microorganisms to various health benefits, further research is needed in order to establish them and evaluate their safety as well as their nutritional aspects. The purpose of this paper is to review the possible beneficial properties of Probiotics bacteria in the literature. [1]

The association of probiotics with well-being has a long history. The word Probiotics is derived from Latin meaning 'favorable to life' it is live microbial feed supplement which beneficially affects the host animal by improving the microbial balance. Recently the most widely used definition which contributed to the development of the probiotic concept in several ways was that of Fuller: "probiotics are live microbial feed supplements which beneficially affect the host animal by improving microbial balance." [2]

The definition used at present was given by the Food and Agriculture Organization of the United Nations World Health Organization, according to which Probiotics are redefined as "live microorganisms which when administered in adequate amounts confer a health benefit on the host." In relation to food the definition can be adjusted by emphasizing that the beneficial effect is exerted by the microorganisms "when consumed in adequate amounts as part of food". [3]

The root canal houses the pulpal tissue. The bacteria can gain access to the canal or through the apex. The factors can be many as (1). Caries, (2). Trauma, (3). endoperio lesions,(4). erosion, arittion and abrasion,(5). microleakage arond the restorations,(6). Operative procedures, (7). anachoresis

Whatever may be the reason, bacteria are very important for infection. Bacteria can be present deep inside the dentinal tubules which can't be eliminated by routine cleaning and shaping procedures. The microbiology of the canal varies with the etiology. The bacteria that are resent in case of periapical abscess is different from the one in retreatment cases and the teeth which are necrotic. Thorough understanding of the microbial flora of the root canal is fundamental to successful endodontic treatment.

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Colonisation will depend on the following factors: 1.Redox potential. 2.Nutrients 3.Symbiosis 4Antagonisms ,5 Host immune-competence

Most common bacteria isolated from the root canals with primary endodontic infections: In primary endodontic infections 10-20 species of microfolra are present. It has been proven that long standing lesions have higher amount of microflora. Also, the larger the periapical lesion the greater the amount of bacteria present.

1) Black pigmented Gram-negative anaerobic rods: Prevotella intermedia, Prevotella nigrescens, Prevotella tannerae, Prevotella multissacharivorax, Prevotella baroniae and Prevotella denticola, Porphyromonas endodontalis and Porphyromonas gingivalis

2) Tannerella forsythia (previously called Bacteroides forsythus or Tannerella forsythenis) was the first periodontal pathogen to be detected in endodontic infection.

3) Dialister species are asaccharolytic obligately

MECHANISM OF ACTION

Some Probiotics bacteria do their work by competing for resources and space with pathogens inside the body thus elbowing the bad bugs out of the way. Probiotics trigger the Host's immune system to battle against pathogenic bacteria. They increases resistance towards infectious diseases, stimulates T Lymphocytes to replicate and Arming the T lymphocytes.

DESIRBALE PROPERITIES OF PROBIOTICS

In order for a potential Probiotics strain to be able to exert its beneficial effects, it is expected to exhibit certain desirable properties. The ones currently determined by in vitro tests are(i)acid and bile tolerance which seems to be crucial for oral administration,(ii)adhesion to mucosal and epithelial surfaces, an important property for successful immune modulation, competitive exclusion of pathogens, as well as prevention of pathogen adhesion and colonization, (iii)antimicrobial activity against pathogenic bacteria,(iv)bile salt hydrolase activity. [4]

• Increases the absorption of minerals and vitamins and improves digestion, especially of milk products.

• Produces vitamin B Complex.

• Supports healthy liver function.

• Normalizes bowel movements and promotes its regularity

• Prevents intestinal tract infections from Helicobacter pylori and Candida.

• Assists in cholesterol management.

• Protects against harmful bacteria, fungi and viruses.

SOURCES OF PROBIOTICS

Probiotics can be used in powder, liquid, gel and granules or capsules form. Broadly two divisions of sources are there that is, natural and commercial.

Natural Sources are: 1.Bifidobacteriumanimalis.2. Lactobacillus acidophilus.

3. Lactobacillus casei.4. Saccharomyces boulardii.

COMMERCIAL SOURCES

1. Probiotic curd 2. Probiotic desserts

ROLE OF PROBIOTICS

Probiotics have been found to be beneficial to host health. In medicine, Probiotics are used mainly in support therapy for gastro-intestinal diseases. In recent years, probiotics have been used as a treatment to promote oral health. There has also been a change in understanding of the oral disease process because of be◎er understanding of the ecology and microbiology of the oral cavity. Very encouraging studies exploring probiotics in the fields of caries, periodontal diseases and few other areas have come up in the recent past and the results tend to suggest beneficial effects of probiotics on oral health and on the whole body in general. Extensive research to create a Probiotics product intended to maintain dental and periodontal health is needed.**[5]**

PROBIOTICS & ORAL HEALTH

1. Direct actions in oral cavity 2. Interferes with binding of primary colonizers of plaque. 3. Competes with plaque forming bacteria. 4. Indirect actions in oral cavity 5. Modulate systemic immunity 6. Effect on local immunity.

PROBIOTICS AND DENTAL CARIES

The root canal houses the pulpal tissue. The bacteria can gain access to the canal either coronally or through the apex. These include :

1. Caries 2. Trauma 3. Endo perio lesions 4. erosion, and abrasion

5. micro leakage around the restorations 6. Operative procedures 7. anchoresses .

Whatever may be the reason, bacteria are very important for infection. Bacteria can be present deep inside the dentinal tubules which can't be eliminated by routine cleaning and shaping procedures. The microbiology of the canal varies with the etiology. The bacteria that are resent in case of periapical abscess is different from the one in retreatment cases and the teeth which are necrotic. Thorough understanding of the microbial flora of the root canal is fundamental to successful endodontic treatment.

Colonisation will depend on the following factors:

1.Redox potential 2.Nutrients 3. Symbiosis 4.Antagonisms 5. Host immune-competence

PROBIOTIC BACTERIA IN DENTAL CARIES

1. Streptococcus thermophilus 2.NCC1561 3.NCC1529 4.Lactococcuslactis

5. NCC2211 6. NCC2225 7. Lactococcuszease

PROBIOTICS AND PERIODONTAL DISEASES

- Probiotics lower the pH so that bacteria cannot form dental plaque and calculus.

- Probiotics play an important role in the prevention of Gingivitis.

- Probiotics have been shown to inhibit the growth of micro organisms which cause periodontal diseases.

PROBIOTIC BACTERIA IN PERIODONTAL DISEASES

Streptococcus oralis. 2. Streptococcus uberis. 3. Lactobacillus reuteri.

Probiotics in Root Canal

Bacteria and their byproducts are considered to be the primary etiologic agents of pulpal necrosis and periapical lesions. [6]

Although multiple factors contribute to endodontic failures, the literature suggest that persistent intraradicular or secondary infections are the major causes of failed root canal treatment. [7]

Studies have shown that root canal microbiota of teeth with failed endodontic treatment differs from that normally found in untreated teeth.*Enterococcus faecalis* is the most commonly isolated species being recovered in over one third of the canals of root filled teeth with persisting periapical lesions. [8]

Enterococcus faecalis is a gram positive cocci and constitutes a small percent of the initial flora in the root canal; however once established intraradicularly, the microorganism is able to survive. Endodontic sealers are utilized to prevent periapical exudates from diffusing into the unfilled part of the root canal and to prevent residual bacteria from reaching the periapical tissues, via elimination of gaps between the core filling material and the canal walls. [9]

Zinc oxide eugenol sealers are known for their antimicrobial effect through the action of eugenol. In vitro studies have found greater antimicrobial effects against *E. faecalis* with ZOE based sealers in comparison to calcium hydroxide based sealers and resin based sealers. Zinc oxide eugenol sealer is a commonly used root canal sealer. The susceptibility of E. faecalis to antibiotics such as amoxicillin and different combinations of amoxicillin has been examined. Within the last few years, antibiotics have been used in dentistry systemically and topically. Chronic periradicular lesions associated with pulp necrosis do not have adequate blood supply. So, the concentration of antibiotics reaching root canal system in systemic administration is negligible and not beneficial.**[10]**

Systemically administered antibiotics have some complications such as toxicity, allergic reaction and development of resistant strains of microorganisms. It has been reported that the main advantage of local antibiotics compared to systemic use is that systemic complications are prevented and that substantially higher concentrations can be used. [11]

Susceptibility of E. faecalis to various antibiotics, such as amoxicillin, vancomycin, erythromycin, benzyl

penicillin and doxycycline has been assessed in a series of studies. [12]

Most common bacteria isolated from the root canals with primary endodontic infections. In primary endodontic infections 10-20 species of microfolra are present. It has been proven that long standing lesions have higher amount of microflora. Also, the larger the periapical lesion the greater the amount of bacteria present.

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2) Tannerella forsythia (previously called Bacteroides forsythus or Tannerella forsythenis) was the first periodontal pathogen to be detected in endodontic infection.

3) Dialister species are asaccharolytic obligately

• To be able to display a probiotic effect against caries

• Bacteria must be Able to adhere to the tooth surface where cariogenic bacteria reside.

• Has to become a part of the biofilm that develops on teeth.

• Must compete with cariogenic bacteria to reduce their levels of colonization.

PROBIOTICS AND HALITOSIS

- Probiotics break down putrescence odors by fixing the toxic gases produced by pathogenic bacteria.

- Various studies have shown a direct link between low levels of streptococcus salivarious in the mouth and development of halitosis.

- Streptococcus salivarious K12 dominate over the key pathogens responsible for halitosis.

PROBIOTICS & CANDIDIASIS

• Probiotic cheese (Lactobacilli and Bifidobacteria) reduces oral candidiasis.

• Increases salivation in elderly people

PROBIOTICS IN ONCOLOGY

• Studies have shown that probiotic with Lactobacillus has improved food intake and gain in body weight in experimental animals suffering from cancer.

FUTURE OF PROBIOTICS

It is a new and interesting field of research, a single application of a modified strain could give lifelong protection against tooth decay. That's a tall promise from the field of Probiotics. But with the sufficient scientific research, probiotics might one day provide wholesome antidotes to all infection. Bacteria will keep the dentist away.

CONCLUSION

A significant increase in the role of Probiotics in nutrition and medicine over the decade and while their application in the prevention and treatment of various disorders should be considered by medical professionals and promoted by the food industry.

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REFRERENCES

1. Swati Choudhary, Pallavi Chauhan, Krishna Deo Prasad, Vibha Jain, et al. PROBIOTICS – A REVIEW. International Journal of Contemporary Microbiology, January-June 2015, Vol.1, No. *1*
2. Fuller R, "Probiotics in man and animals" Journal of Applied Bacteriology, vol. 66, no. 5, pp. 365–378, 1989
3. FAO/WHO, Report on Joint FAO/WHO Expert Consultation on Evaluation of Health and Nutritional Properties of Probiotics in Food Including Powder Milk with Live Lactic Acid Bacteria, 2001.
4. Maria Kechagia, Dimitrios Basoulis, Stavroula Konstantopoulou, et al., "Health Benefits of Probiotics: A Review," ISRN Nutrition, vol. 2013, Article ID 481651, 7 pages, 2013.

doi:10.5402/2013/481651.

5. Bhardwaj A, Bhardwaj SV. Role of Probiotics in Dental Caries and Periodontal Disease. Arch Clin Exp Surg. 2012; 1(1): 45-49.
6. Takahashi K. Microbiological, pathological, inflammatory, immunological and molecular biological aspects of periradicular disease. Int Endod J 1983;31:311-25.
7. Siqueira JF Jr.Aetiology of root canal treatment failure: why well treated teeth can fail. Int Endod J 2001;34:1-10.
8. Molander A, Reit C, Dahlen G, Kvist T. Microbiological status of root-filled teeth with apical periodontitis. Int Endod J. 1998;31:1–7.
9. Hoelscher AA1, Bahcall JK, Maki JS. In vitro evaluation of the antimicrobial effects of a root canal sealer-antibiotic combination against Enterococcus faecalis. J Endod. 2006 Feb; 32(2):145-7.
10. Abbo? PV, Hume WR, Pearman JW. Antibiotics and endodontics. Aust Dent J. 1990;35:50–60.
11. Goodson J. Pharmacokinetic principles controlling efficacy of oral therapy. J Dent Res. 1989;68:1625–32.
12. Safavi KE, Spangberg LS, Langeland K. Root canal dentinal tubule disinfection. J Endod. 1990;16:207–10.

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Public Health Act and Subsidiary Legislation in India

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ABSTRACT

Health care is the fundamental right of every human being. Right to health and its correlation with the right to health care was first outlined in The Article 25 of the Universal Declaration of Human Rights in 1948, wherein the right to health was conceived as an individual's civil right and states were bound to provide minimum conditions to enable individuals to enjoy this right and to provide primary health services in an equal and fair manner. The primary goal of public health is to prevent disease and promote health of population. Public health law could be defined as the study of the legal powers and duties of the State. Public health law focuses on the nexus between legal powers and duties of the State, the law and legal tools.

Keywords : *Public Health , Act, Legislation, Health care delivery system*

INTRODUCTION

The concept of "right to health" has generated so many questions such as right to medical care, right to health, right to responsibility for better healthy environment, right not to reproduction as (family planning, sterilization, legal abortion), rights of the deceased persons (determination of death, autopsies, organ removal) and the right to die (suicide, hunger strike, discontinuation of life support measures) etc. The right to health is recognized by numerous international institutions, covenants, conventions and our Constitution. Health is highly influenced by the health care facilities available in a country to its population. The non-provision of health care facilities is considered as the violation of basic human right.

The Indian Constitution has sufficient provisions for the protection and growth of every individual, worker and group and vulnerable population in relation to nutrition and health. However, it is also essential to make some services mandatory and should be under the rules and regulations. The government and the people are required to carry out their duties to achieve the Constitutional objectives. For this the Constitution also provides powers to frame the legislation.

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The Constitution of India has provided guarantees and policy directives in Part III (Fundamental Rights) and Part IV (Directive Principles of State Policy) for the right to health and healthcare. The Supreme Court of India has articulated in several landmark judgments (Consumer Education and Resource Centre *v.* Union of India AIR 1995 SC 636; State of Punjab and Others *v.* Mohinder Singh AIR 1997 SC 1225) that the right to health is integral to the right to life under Article 21 of the Constitution of India.[1]

History of Laws and Health care delivery system

The reach of public health law is as broad as public health itself and both have expanded to meet the needs of society. In 1946**,** detail plans for health development had been presented in the 'Report of the Health Survey and Development Committee' to the Government of India under the chairmanship of Sir Joseph Bhore. [2]. According to The United Nations Universal Declaration on Human Rights, 1948, Article 25: " Everyone has standard of living adequate for the health and well-being to humans, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond human control". Elderly, motherhood and childhood are entitled to special care

and assistance. All children, whether born in or out of wedlock, enjoy the same social protection. [3]

In 1950 Indian constitution proclaimed it as a 'sovereign socialist secular democratic republic', which guarantees "the right to life and liberty" (Article 21) and includes among the duties of the State "to raise the level of nutrition and the standard of living and to improve public health" (Article 47). [4]. Hugh R Leavell and Edwin G Clark (1965) elaborated that prevention does not only mean prevention of disease and promotion of health but it also includes the prevention of disability and death by early diagnosis and treatment, thus laying the foundations of preventive medicine. [5]

Thomas McKeon (1966), highlighted the role of social policies in health development in his book 'Introduction to Social Medicine'.[6] International Covenant on Economic, Social and Cultural Rights (1966) further state in Article 12 that the States recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health. [7] .

Prof. Samuel H Preston (1975) concluded that no doubt the rise in incomes have led to rise in life expectancies but technological changes in medicine have played an important role. [8]. United Nations (1983) had also presented comprehensive millennium development goals for better health. Consequently Government of India also formulated its first National Health Policy in 1983. [9]. The role of public health was re-emphasized by the Expert Committee on Public Health Systems (1996) formed by the Ministry of Health and Family Welfare, Government of India. [10]. Voluntary Health Association of India's (VHAI) Independent Commission on Health (1997) also stressed the need to open new schools of public health. [11].

Eminent scholar Frank Grad observed in (1998) that public health law does not come in a neat legislative package, but consists of many types of legislations which have little in common except for the benign purpose of advancing public health.[12] Calcutta Declaration on Public Health (1999) emphasized the leadership role for public health and identified the need for creating career structures at the national, state, provincial and district levels. [13]. While on the one hand, the right to health is guaranteed as a fundamental right, the Constitution also imposes a positive duty on the State under Article 47 to raise the level of nutrition and the standard of living, and to improve public health to ensure the right to healthcare. Thus, as endorsed in the Declaration of Alma Ata in 1978, the attainment of the highest possible level of health becomes the key worldwide social goal. Public health law could be defined as the study of the legal powers and duties of the State, to ensure conditions for people to be healthy with collaboration from multiple stakeholders (e.g. healthcare professionals, business, community, media etc. [14].

According to Constitution of India, public health is a subject for the states to legislate. However, very few states in India have crafted public health legislations. At the national level, the archaic 112-year-old Epidemic Diseases Act, 1897 is an example of the nature of laws dealing with public health emergencies. There are also some 'policing' provisions in legislations such as the Indian Penal Code that date back to 1860, which seek to protect the public's health in the face of an epidemic. The post-Independence laws were more progressive and addressed various issues concerning public health, albeit in a piecemeal manner, for which the Constitution laid a strong foundation under Part III (Articles 14, 15, 17, 21, 23, 24), which are mandatory and Part IV (Articles 38, 39, 41, 42, 47, 48A, 51(c), 51A), which are directives. However, the need for a comprehensive public health law has always been felt. The Ministry of Health and Family Welfare, Government of India has proposed drafting this much needed law **(The National Health Bill, 2009)** for consideration by Parliament. Preservation of public health through enforcement and enactment of appropriate laws is one of the most important goals of governments. The public health law approach posits that the government has both the power and the duty to regulate private behaviour in order to promote public health. [15].

Public health law includes analyzing the externalities that affect the magnitude of a public health risk. Externality refers to an impact on a third party that was uninvolved and might be positive or negative in nature. Public health measures also include efforts towards reduction of negative externalities of human behaviour. For instance, one of the major public health concerns is involuntary exposure to second-hand tobacco smoke. In 2001, the National Human Rights Commission of India took up the cause of violations of rights of born and unborn children who are a vulnerable group and often exposed to tobacco smoke (active and passive) in home or public areas. [16]

Public health police powers are exercised by health officers, fire officers, municipal commissioners and judges. The laws are rules of the state. They regulate the individual and community behavior some laws come into existence out of the local customs and traditions. The public health actions are not intended to punish, but to improve and to monitor the health status in the community. Tobacco is today the world's biggest preventable cause of death and results in a range of diseases including cardiovascular diseases, cancers and pulmonary diseases. It is argued that a strict implementation of the Framework Convention of Tobacco Control (FCTC) and Cigarettes and Other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003 can result in a decrease in the number of deaths caused every year. [17].

In the same directions government of India has initiated National Legal Literacy Mission in 2005. Under this mission public health professionals should take part of imparts education on legal aspect of public health. In addition to improving the health of the people, these legislations also have provision of legal action against those trying to jeopardize it, in any way. [18].

Unfortunately, these legislations are not implemented as designed, due to some reasons and public health remains vulnerable to social, psychological and physical situations.

Problems of Public Health Care System in India

According to WHO, Health services should be comprehensive, accessible, acceptable and available at the free of cost for community. A nation of about 125 crore people today has a dream of a prosperous healthy future. We entered the 21st century with all the paraphernalia of our tradition, culture, family system, religious beliefs, folk and homemade medicine and information technology. In India, though modern medical facilities, science and technology have contributed much to the field of medicine, health care services have no reached the rural areas in good measure. Nearly 60 percent of the Indian populations are living in rural areas but only limited medical facilities are available for them. Though private health care services are flourishing, public health carte remains almost neglected. Private health care services are not affordable to the poor. In India, there are a number of systems of medical treatment but good medical care is a distant dream to many financially under privilege people of India. Because, their costly health services have not been reached to the needy and poor people of the country.

According to the Constitution of India, health is a subject of states, Central Government's intervention to assist the State Governments is needed in the area of control or eradication of major communicable or non communicable diseases, broad policy formulation, medical and paramedical education along with regulatory measures, drugs control and prevention of food adulteration, besides activities concerning the containment of population growth including child survival and safe motherhood and immunization programme. In the area of public health, India is lacking of a Comprehensive National Public Health Act, in which preparedness for epidemics and disasters, surveillance of communicable and non communicable diseases, environmental sanitation including safe water supply, waste disposal and preventive and curative health care services should be appropriately handled. All public health legislations use these tools for enforcement and wherever these tools are lacking the legislations are infective. However, there are many other factors of failure of legislations such as lack of awareness, lack of infrastructure etc. Public health services have been neglected for a long time in India, and the resultant vacuum has been increasingly filled by the 'quacks' in the villages and corporate medical care hospitals in the urban areas. The financial allocation is not adequate to meet the requirements of the people. 80 percent health facilities are provided in urban areas. India spends only 4.4% of its budget on health, which is far below the global median of 11.5%. As a consequence; India's health-care infrastructure is substandard and inadequate, lacking doctors, inadequate paramedical staff, and scarcity of medicines and essential drugs, people do not enjoy the benefits of modern curative and preventive health services. There are six doctors and nine hospital beds per 10,000 people. [19]

With technological advancements, the cost of healthcare is rising but investments in health are not rising. India invests only 1.1% of its gross domestic product (GDP) on health which is much lower than even other developing countries. [20]. People have to pay heavy fee for medical care from out-of-pocket not only when they avail medical services from private health sectors. People have to pay out-of-pocket in public

institutions as in these institutions the shortage of drugs and diagnostics is endemic and human resources are also in short supply, more so in rural areas. [21]. According to National Sample Survey Organization 71st survey round the average cost of hospitalization per case were Rs. 16,956 and Rs. 26,455 respectively in rural and urban area.[22]. National Health Policy (2002) expressed the intention of the government to correct these deviations and some efforts have been made by government of India.[23]. According to a 2011 Supreme Court order, private hospitals are supposed to provide free treatment and hospitalization to the poor. [24]

SUGGESTION AND CONCLUSION

Indicators of progress in reproductive health include a low or lowered Maternal Mortality Ratio (MMR), decreased numbers of child marriage, low adolescent birth rates, access to contraception, general access to reproductive health education, better nutrition, hygienic living conditions and lower levels of poverty overall. There is need for public health law to realize the urgency of regulating the modifiable patterns of behaviour among people to strengthen the capacity of the community against public health risks involving, in particular, use of tobacco, diet and exercise. Laws should, therefore, not be used in isolation but as one of several tools for the attainment of public health goals. Government of India should provide universal coverage of essential health package through tax-based funding; increase budgetary outlays for health progressively; correctly set priorities of health interventions; strengthen public health infrastructure; improve governance of health services- human resource, procurement and distribution; strengthen medical education with quality to generate adequate workforce; ensure regulation of private providers through legislation and enforcement; and strengthen independent monitoring system to build accountability using information technology.

It is important to assess the probability of the proposed legislation being a successful intervention in addressing population risks. Given the paradox of purposes and perspectives, the feasibility of the proposed law can be analyzed from the support of policy-makers, enforcement officials, civil society and the public at large, besides the opposition from quarters that have vested interests in its non-implementation. Our legal experts and social activists have very important role to play in realization of basic fundamental rights provided in the Indian Constitution by to provide public awareness, legal education, free legal aid clinics in rural and urban community.

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REFERENCES

[1]. Consumer Education and Resource Centre v. Union of India AIR 1995 SC 636; State of Punjab and Others v. Mohinder Singh AIR 1997 SC 1225.

[2]. Government of India. Report of the Health Survey and Development Committee,(1946) Volume I, Volume II and Volume III,

[3]. The United Nations Universal Declaration on Human Rights , 1948, Article 25:

[4]. Constitution of India (1949) Article 21 and Article 47,

[5]. Leavell HR, Clark EG (1965). Preventive Medicine for the Doctor in his Community: An Epidemiologic Approach. New York: McGraw Hill;

[6]. McKeown T, Lowe CR (1966) Introduction to Social Medicine. 2nd ed. Oxford: Blackwell Scientific Publications;

[7]. United Nations. International Covenant on Economic, Social and Cultural Rights (1966).

[8]. Preston SH (1975). The changing relation between mortality and level of economic development. Population Studies 29, No. 2, July 1975. Int. J Epidemiol. 2007;36:484–90.

[9]. Government of India (1983). National Health Policy. Ministry of Health and Family Welfare, New Delhi, 1983.

[10]. Report of the Expert Committee on Public Health System, Ministry of Health and Family Welfare, Government of India. 1996.

11]. Report of the Independent Commission on Health & Development. New Delhi: Voluntary Health Association of India; 1997.

[12]. Grad FP. Public health law: Its form, function, future, and ethical parameters. Int Dig Health

Legis. 1998;49:19–39.

[13]. Ashton JR (1999). Regional conference on public health in South East Asia in the 21st century, Calcutta, 22–24 November 1999. J Epidemiol Community Health. 2000;54:749.

[14]. Gostin LO. Legal foundations of public health law and its role in meeting future challenges. J Roy Ins Pub Health 2006;Suppl 1:8–15.

[15]. Gostin LO. Public health law: Power, duty, restraint. Berkeley: University of California Press; 2000.

[16]. Reddy KS, Gupta PC . Protection of vulnerable groups: A human rights' approach to tobacco control: Report on tobacco control in India. New Delhi: Ministry of Health and Family Welfare, Government of India; 2004:294–7.

[17]. Jha P, Jacob B, Gajalakshmi V, Gupta PC, Dhingra N, Kumar R, et al. A nationally representative case–control study of smoking and death in India. N Engl J Med 2008;358:1137–47.

[18]. National legal services authority, Ministry of law and justice, Govt. of India, 2005.

[19]. WHO, World Health Statistics 2011.

[20]. National Health Accounts India(2009). Ministry of Health and Family Welfare, Govt. of India ,New Delhi.

[21]. Rao KD. Human Resources Background Paper I-UHC India. New Delhi: Public Health Foundation of India.

[22]. Key Indicators of Social Consumption in India - Health.(2015) National Sample Survey Organization. 71st Round (January to June 2014) Ministry of Statistics and Program Implementation, Govt. of India.

[23]. National Health Policy (2002). Ministry of Health and Family Welfare, Govt. of India, New Delhi.

[24]. India Today, Supreme Court Tells Private Hospitals to Provide Free Treatment to Poor, September 1, 2011.

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A Comparative Evaluation of Laboratory Diagnosis of Malaria : Microscopy Versus Rapid Diagnostic Test

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ABSTRACT

Introduction : Rapid detection and effective treatment of malaria is a prerequisite in reducing the morbidity and mortality due to the disease. The Rapid diagnostic tests (RDT) have opened a new and exciting avenue in rapid malaria diagnosis. **Aim**: To compare the effectiveness of Rapid Diagnostic Test to Microscopic examination in diagnosis of malaria. **Materials & Method**: The present study was conducted at MediCiti Institute of Medical Sciences, Medchal from July 2015 to June 2016. Blood samples were collected from 986 clinically suspected malarial cases and subjected to both blood smear microscopy and a rapid diagnostic test (ADVANTAGE MAL CARD) for detection of malaria parasites and antigens, respectively. **Results:** Out of the 986 fever cases included in the study, 36 (3.64%) tested positive for malaria by Rapid Diagnostic Test (RDT) whereas 31 (3.14%) tested positive by Microscopy. Sensitivity for the rapid diagnostic test for malaria was 100% and Specificity was 99.5%. **Conclusion:** This study shows that the rapid diagnostic test kit has comparable level of accuracy with microscopy and hence can be used in rapid screening of malaria. RDTs can be useful in areas where specialized laboratories or even microscopy are unavailable and when urgent malaria diagnosis is needed by a practitioner without the delay associated with the laboratory.

Keywords : *Malaria, diagnosis, microscopy, rapid diagnostic test, parasite lactate dehydrogenase(pLDH).*

INTRODUCTION

Malaria is a mosquito-borne infectious disease of humans and other animals which becomes a devastating global public health problem. It is a major killer of mankind, especially in developing countries where it becomes one of the major causes of morbidity and mortality.[1] The disease affects the population of tropical and subtropical areas worldwide. Among the 5 species of Plasmodium (P. falciparum, P. vivax, P.ovale, P.malariae and P. knowlesi) that cause malaria in humans, P. falciparum (Pf) is the most dangerous and responsible for most of the morbidity and mortality. [2] According to the World malaria report 2015, there were about 214 million cases of malaria and an estimated 4,38,000 deaths worldwide. Officially, at least 1.2 million malaria cases are reported every year in India. The most affected geographical areas are the northeastern states along with the states of Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Telangana, Andhra Pradesh, Maharashtra, Gujarat, Rajasthan, West Bengal and Karnataka (Park, 2015). Out of 1.2 million malaria cases, 35,00,000 cases are reported from Telangana.

Traditional practice for outpatients has been to treat presumptively for malaria based on history of fever but a significant proportion of those treated may not have parasites (over 50% in many settings) and hence waste a considerable amount of drugs. [3] This old clinical based practice is still relevant today especially, in infants where time spent on getting a confirmatory laboratory diagnosis could lead to increased fatality.

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Widespread prescription of chloroquine to patients not having malaria has been tolerated, partly because chloroquine is so cheap. However, artemisinin-based combination therapy (ACT) costs at least 10 times more per treatment. Moreover, overdiagnosis of malaria implies underdiagnosis and inappropriate treatment of non-malarial febrile illness while a high proportion of such illnesses are self-limiting viral diseases, and a significant minority, such as acute respiratory infections or bacterial meningitis, are bacterial diseases and potentially fatal. [3]

WHO currently makes the tentative recommendation that parasite-based diagnosis should be used in all cases of suspected malaria with the possible exception of children in high-prevalence areas and certain other situations.[4,5] For this recommendation to be adhered to obviously, rapid and accurate laboratory finding or demonstration of malaria parasite should be established.

Rapid detection and effective treatment of malaria is a prerequisite in reducing the morbidity and mortality due to the disease in malaria endemic areas. [6] Microscopy is considered as the gold standard diagnostic procedure for malaria detection since it is inexpensive to perform, can differentiate malarial parasite species, and also can be used to quantify parasites. Although, this method remains the gold standard, it is laborious and requires considerable expertise for its interpretation, particularly at low levels of parasitaemia. [7]

This challenge has led manufactures and scientists to develop antigen detecting malaria Rapid Diagnostic tests (RDTs) in many malaria endemic countries. RDTs are commercially available in kit forms and easy and quicker to perform, does not require extensive training or equipments to perform or to interpret results. The Rapid Diagnostic tests (RDTs) have opened a new and exciting avenue in rapid malaria diagnosis. [8]

AIM

The aim of the study is to compare the effectiveness of Rapid Diagnostic Test to Microscopic examination in diagnosis of malaria.

MATERIALS AND METHOD

The study was conducted at Department of Microbiology, MediCiti Institute of Medical Sciences, Medchal between July 2015 to June 2016. A total of 986 samples were collected from clinically suspected cases of malaria. 1 millilitre of blood was collected by venipuncture aseptically in a sterile tube containing EDTA.

Staining

For diagnosis of malaria, thick and thin smears were prepared, stained with Leishman's stain according to standard guidelines and were examined for malaria parasite by microscopy. Atleast 100-200 fields, each containing 20 WBCs were examined before thick smear was reported as negative for malaria. The red blood cells in the tail end of the thin smear were examined for the species identification and stages of the parasites.[9,10]

Antigen detection

All the samples were then subjected to antigen detection using ADVANTAGE MAL CARD kits (Company-J Mitra) evaluated by WHO. ADVANTAGE MAL CARD is a visual, rapid and sensitive immunoassay for the qualitative diagnosis of infection with Pf and other Plasmodium Species (Pf/ Pv/ P. malariae/ P.ovale) in human whole blood based on the "sandwich" principle. The conjugate contains colloidal gold conjugated to monoclonal anti-pan specific pLDH (parasite Lactate Dehydrogenase) antibody. The test uses monoclonal anti-P.f pLDH antibody (test line F) & monoclonal anti-Pan specific pLDH antibody (test line P) immobilized on a nitrocellulose strip. The test was performed as per kit instructions manually and interpreted accordingly.

All kit components were brought to room temperature. The anticoagulated blood sample was mixed by gentle swirling. The sample dropper was dipped in the sample and the blood so collected was transferred onto the sample pad in the sample well.3 drops of the Assay Buffer was added in the buffer well . At the end of 15-20 minutes results were read as: appearance of only one purplish pink coloured line at Control (C) region indicated that the sample is non-reactive for P.falciparum and the other Plasmodium Species(P.vivax/ P.malariae/ P.ovale), appearance of two purplish pink coloured lines one each at Pan region (P) & Control region (C) only indicated that the sample is reactive for P. vivax / P. malariae / P. ovale only), appearance of three purplish pink coloured lines one each in P.f. region (F),P & C region indicated that the sample was reactive for P. falciparum and/or P. vivax / P. malariae / P. ovale. The test was invalid, if no line appeared after the completion of test, either with clear background or with complete

pinkish/ purplish background.

RESULTS

All 986 fever cases included in the study were subjected to both Rapid Diagnostic Test and blood smear examination and the results were compared. Results are shown in Table 1 and 2. 36 (3.64%) tested positive by Rapid diagnostic test and 31 (3.14%) by blood smear.

Out of these 31 fever cases positive by blood smear, RDT was also positive in 31 cases. Out of the 36 patients positive by RDT, 3 were positive for P.vivax and 33 for P.falciparum. Out of the 31 patients positive by blood smear, 2 were positive for P.vivax and 29 for P.falciparum. Out of the 3 patients who tested positive for P.vivax by RDT, 2 were positive for P.vivax by both RDT and blood smear, whereas 1 was positive by RDT but negative by blood smear. Of 33 cases positive for P.falciparum by RDT, 29 were positive by blood smear whereas 4 were negative by blood smear. No mixed infection was seen.

The sensitivity of RDT for diagnosis of malaria was 100% and the specificity was 99.5%. For detection of P.falciparum the sensitivity of RDT was 100% and specificity was 99.6%. The PPV of RDT for diagnosis of all malaria was 86%, and for P. vivax and P. falciparum was 66.7% and 87.9% respectively as shown in Table 3.

Table 1: Detection of malarial parasite by PS and pLDH method(Advantage Mal card test)

	PS	pLDH (Advantage Mal card test)
Total Malaria positive	31 (3.14%)	36 (3.64%)
P.falciparum positive	29 (93.54%)	33 (91.67%)
P.vivax positive	2 (6.45%)	3 (8.33%)
Mixed	0	0

Table 2: Comparison of results of Rapid Diagnostic kit Test and Microscopy of blood smears for malaria

RAPID DIAGNOSTIC TEST RESULTS	MICROSCOPY RESULTS		TOTAL NO.
	+VE NO.	-VE NO.	
Total malaria			
Positive	31	5	36
Negative	0	950	950
TOTAL	31	955	986
All Plasmodium vivax			
Positive	2	1	3
Negative	0	983	983
TOTAL	2	984	986
All Plasmodium falciparum			
Positive	29	4	33
Negative	0	953	953
TOTAL	29	957	986

Table 3: Validity indicators were calculated for RDT for diagnosis of malaria taking blood smear examination as the gold standard.

VALIDITY INDICATOR	Total Malaria %	Plasmodium vivax %	Plasmodium falciparum %
SENSITIVITY	100	100	100
SPECIFICITY	99.5	99.9	99.6
PPV	86.1	66.7	87.9
NPV	100	100	100
ACCURACY	99.5	99.9	99.7

PPV : Positive Predictive Value, NPV: Negative Predictive Value

DISCUSSION

There are four principal methods for diagnosing malaria. These are symptomatic, microscopy, antigen test and molecular methods. Symptomatic diagnosis is the most common, and people in poorer countries often use symptoms alone to diagnose malaria. However, it should be noted that many other diseases present symptoms very similar to malaria, and diagnosis by symptoms alone can be misleading and even harmful. Treating for malaria where other treatment is called for leaves the actual disease uncured and the patient in critical condition. A percentage parasitaemia need therefore be adopted to correlate with clinical presentation. It is therefore imperative to follow up symptomatic diagnosis with one of the other more accurate methods.

Microscopic examination of blood, ever since the singular discovery of Laveran, the French scientist who first identified the plasmodium parasite, is the most reliable method of diagnosing malaria. Therefore, a specimen of blood is observed under the microscope for presence of the malaria parasite. Although, other bodily fluids like saliva or urine can also be used as less invasive methods, blood is preferred for higher concentration of the parasite.

The traditional method of microscopic identification of parasite however, is not only daunting in poor power setting, but also time consuming and requires a lot of expertise/training. Thus microscopy is generally, limited to larger clinics/tertiary centers. This conventional staining of peripheral blood smears/microscopy however still remains the gold standard in laboratory diagnosis of malaria.

RDTs are commercially available in kit forms with all necessary reagents and the ease of performance of the procedures, does not require extensive training or equipments to perform or to interpret the results. Results are read in 12–15 min. [7]

In the present study, RDT identified more positive cases than the gold standard blood smear test (3.64% versus 3.14%), and this was may be due to persistently circulating antigen and prior use of antimalarials. Observations are similar to Azikiwe CCA et al [12] and Tathe et al [11] .

The sensitivity of RDT for diagnosis of malaria in the present study was 100% and the specificity was 99.5%. For detection of P.falciparum the sensitivity of RDT was 100% and specificity was 99.6%. This may be explained by the fact that P.falciparum can sequester and not be present in circulating blood. This suggests that the Advantage Mal card test may provide a more precise diagnosis of patients infected with P.falciparum malaria by detecting parasites that would be missed by traditional blood film screening. This study is comparable to the study by Carol et al as they suggested that OptiMAL test had sensitivities of 94 and 88% and specificities of 100 and 99%, respectively, when compared to traditional blood films for the detection of P. vivax and P. falciparum malaria.[14] Manali et al showed a sensitivity and specificity of 97% and 98% in vivax and 95% and 98% in falciparum, respectively, when compared with peripheral blood smear. [15] Manali et al have suggested that the sensitivity of Advantage mal card which detects pLDH antigen showed sensitivity of 97% for P. vivax. [15] Tathe et al examined the ability of Advantage mal card and found sensitivity and specificity of 99.24% and 100% respectively. [11]

The PPV of RDT for diagnosis of all malaria was 86%, and for P. vivax and P. falciparum was 66.7% and 87.9% respectively. This is comparable with the study of Fransisca et al which showed the PPV of P.falciparum as 88% [13] and Woyessa et al which showed PPV of overall *malaria* (76.7%) and *P. falciparum* (87.5%) in household surveys. [16]

Observations of this study are comparable to other published studies. [17,18]

CONCLUSION

The present study shows that the rapid diagnostic test kit has comparable level of accuracy with microscopy and hence can be used in rapid screening of malaria.[12]

Microscopy is simple, economical, sensitive and specific, hence still remains the gold standard method for malaria diagnosis. This method has the advantage of high sensitivity, quantifiable results and accurate speciation, though it is fairly time-consuming. In evaluating the methods for malaria diagnosis, sensitivity, rapidity availability and cost are to be taken into consideration. Microscopy meets these requirements and still remains the gold standard method for malaria diagnosis.

RDTs can detect Plasmodium falciparum infection when parasites are sequestered. This assay may be used

to monitor patient progress during therapy and serves as an indication of recrudescence and possible drug-resistant infections. It is useful in areas where specialised laboratories or even microscopy are unavailable and when urgent malaria diagnosis is needed by a practitioner without the delay associated with the laboratory.

Considering the advantages and disadvantages of the diagnostic methods, Advantage mal card can be employed which has high sensitivity and specificity.

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REFERENCES

1. Anil Kaushik, Sudhir Gahlot, Sadhana Kaushik, B.L. Verma. Rapid Manual Test for Falciparum Malaria. Indian Pediatrics 2001; 38: 650-654.
2. Collins WE, Jeffery GM. Plasmodium malariae: Parasite and Disease. Clinical Microbiology Reviews 2007;20(4):579-592.
3. Shillcutt S, Morel C, Goodman C, et al. Cost-effectiveness of malaria diagnostic methods in sub-Saharan Africa in an era of combination therapy. Bulletin of the World Health Organization 2008;86(2):101-110.
4. Bell D, Go R, Miguel C, Walker J, Cacal L, Saul A. Diagnosis of malaria in a remote area of the Philippines: comparison of techniques and their acceptance by health workers and the community. Bulletin of the World Health Organization 2001;79(10):933-941.
5. WHO. The role of laboratory diagnosis to support malaria disease management. Focus on the use of rapid diagnostic tests in areas of high transmission. WHO. April 2006.
6. Palmer CJ, Lindo JF, Klaskala WI, et al. Evaluation of the OptiMAL Test for Rapid Diagnosis of Plasmodium vivax and Plasmodium falciparum Malaria. Journal of Clinical Microbiology 1998;36(1):203-206.
7. Moody A. Rapid Diagnostic Tests for Malaria Parasites. Clinical Microbiology Reviews 2002;15(1):66-78.
8. Kakkilaya BS. Rapid Diagnosis of Malaria. Lab Medicine 2003 Aug; 8(34):602-608.
9. Kakkilaya BS. Malaria site-All about Malaria. [Monograph on the internet] India;2009. Available from: URL: http://WWW.malariasite.com
10. Chakraborthy P. Plasmodium and Babesia. Textbook of medical parasitology. 1st ed. Kolkata: New Central Book Agency (P) Ltd; 2004: 83-104.
11. S. Tathe, N. S. Tankhiwale, A. Agrawal, S. Vagha. Diagnosis of Malaria by Detection of Parasite Lactate Dehydrogenase with Advantage Mal Card Test. Indian Medical Gazette 2012; 193-198.
12. Azikiwe C, Ifezulike C, Siminialayi I, Amazu L, Enye J, Nwakwunite O. A comparative laboratory diagnosis of malaria: microscopy versus rapid diagnostic test kits. Asian Pacific Journal of Tropical Biomedicine 2012;2(4):307-310.
13. Fransisca L, Kusnanto JH, Satoto TBT, et al. Comparison of rapid diagnostic test Plasmotec Malaria-3, microscopy, and quantitative real-time PCR for diagnoses of Plasmodium falciparum and Plasmodium vivax infections in Mimika Regency, Papua, Indonesia. Malaria Journal 2015;14:103.
14. Palmer CJ, Lindo JF, Klaskala WI, et al. Evaluation of the OptiMAL Test for Rapid Diagnosis of Plasmodium vivax and Plasmodium falciparum Malaria. Journal of Clinical Microbiology 1998;36(1):203-206.
15. Manali M. Kocharekar, Sougat S. Sarkar, and Debjani Dasgupta. Comparative Study of Modified Quantitative Buffy Coat and Two Rapid Tests in Comparison with Peripheral Blood Smear in Malaria Diagnosis in Mumbai, India. Journal of Parasitology Research 2014; Article ID 194651: 7 pages.
16. Woyessa A, Deressa W, Ali A, Lindtjørn B. Evaluation of CareStartTM malaria Pf/Pv combo test for Plasmodium falciparum and Plasmodium vivax malaria diagnosis in Butajira area, south-central Ethiopia. Malaria Journal 2013; 12: 218.
17. Jitendra Sharma, Prafulla Dutta, SA Khan, Pritom Chowdhury, Jani Borah & Jagadish Mahanta. Comparison of different diagnostic techniques for detection of Malaria infection in blood samples

collected from Malaria endemic areas of Assam and Arunachal Pradesh. International Journal of Scientific & Engineering Research 2013; 4(9) : 2587-2603.

18. Bhat Sandhya K , Sastry Apurba S , Nagaraj E.R. , Sharadadevi Mannur , Sastry Anand S. Laboratory diagnosis of malaria by conventional peripheral blood smear examination with Quantitative Buffy Coat (QBC) and Rapid Diagnostic Tests (RDT) - A comparative study. International Journal of Collaborative Research on Internal Medicine & Public Health 2012; 4(10): 1746-1755.

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Socio-Economic Status and Health Challenges of Female Sex Workers

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ABSTRACT

Commercial sex in India is part of society from the ancient period. It is known by different names like Nagarvadhu (brides of the town), Devadasi (temple prostitute), Call girls, Escort girls, Road side brothels, etc. The women engaged in the commercial sex work are always been stigmatized. Many of them could not come in to the business of commercial sex with their own interest. There are various reasons behind entry in such profession. These women are facing a various kind of the problem along with stigmatized life. They are neglected part of the society. Because of poverty, illiteracy and economic reason these women are neglects the health problems.

Keywords: *Prostitution, commercial sex workers, female sex workers, HIV infection*

INTRODUCTION

Female sex Worker as a profession has a long history in India. A whole chapter has been devoted to it in Kautilya's Arthashastra written in *circa* 300 BC and Vatsayana's Kama Sutra written between the first and fourth centuries AD. Insights derived by health practitioners and social workers from the experience of working in red-light areas suggest that the following categories of men are frequent visitors to prostitutes: low-level workers in the manufacturing and transport industries; other workers living away from their families for a length of time; traders and customers in transitory markets; visitors to fairs, festivals and pilgrim centres; defence personnel living away from families; students; pimps and others who have some control over prostitutes; traders and service providers in red-light areas; and professional blood donors. [1]

FEMALE SEX WORKER IN WORLD

Female sex Worker was a part of daily life in ancient Greece. In the ancient city of Heliopolis in Syria, there was a law that stated that every maiden should prostitute herself to strangers at the temple of Astarte. In Armenia the noblest families dedicated their daughters to the service of the goddess Anaitis in her temple at Acilisena. In sex tourism, travelers from rich countries travel to poor countries such as Thailand in search of sexual services which may be unavailable in their own countries or simply too expensive there. Prostitutes are stigmatized in most societies and religions; their customers are typically stigmatized to a lesser degree. Female sex Worker in India is having a long history. India had tradition of Nagarvadhu,"brides of town" Famous examples include Amrapali, state courtesan and Buddhist disciple, described in Vaishali Ki Nagarvadhu by Acharya Chatursen and Vasantasena, acharacter in the classic Sanskrit story of Mricchakatika, written in the 2nd century BC by Sudraka. The Devadasis (handmaiden of god) from temple were known as "temple prostitutes" Kanhopatra is venerated as a saint in the Varkari sect of Hinduism, despite spending most of her life as a courtesan. Vedic texts give account of a mythic empire builder, Bharata, and prove that people were acquainted with prostitution through references to "loose women", female "vagabonds" and sexually active unmarried girls. The Vedic word *sadbarani* refers to a woman who offers sex for payment. In Vedic times, most prostitutes seem to have dressed in red, even their gold jewellery was reddened as this hue was assumed to scare away demons and give protection to those who chose to live in a moral grey zone. A little over 50% of prostitutes come from other countries, such as Nepal and Bangladesh. [2]

In modern India different kinds of prostitution is prevailing apart from prostitutes in brothel there are:

Street prostitutes, Bar dancers, Call girls, Religious prostitutes, Escort girls, Road side brothel, Child prostitutes, Fricatrice prostitutes, Gimmick prostitutes , Beat prostitutes etc. Every hour, four women and girls in India enter prostitution, three of them against their will. Prostitution is a problem in itself and child prostitution is making it more complex. Bangalore, Calcutta, Delhi and Hyderabad, there are an estimated 10,000 girl prostitutes. UNICEF estimates about 300,000 child prostitutes. Girl prostitutes are grouped as common prostitutes, singers and dancers, call girls, religious prostitutes or devadasis and caged brothel prostitutes. Religious prostitutes are mainly found in the South. Caged ones are found in Bombay. The girls tend to come from urban slums and poor rural areas. High prostitute supply regions include Andhra Pradesh, Karnataka, Maharashtra, Uttar Pradesh, Tamil Nadu and West Bengal states. About 85% are Hindus and about 66% are from scheduled castes and tribes. Bangalore and Bombay have a higher proportion of girl prostitutes. Notorious red light districts of India include GB Road in Delhi, Sonagachi in Kolkata, Kamathipura in Mumbai, , Kabari Bazar red area in Meerut and Budhwar Peth in Pune host thousands of sex workers and they are famous red-light centres in India. Gilada's [4] estimates of 100,000 in Bombay, 100,000 in Calcutta, 40,000 in Delhi, 40,000 in Pune and 13,000 in Nagpur are considered overestimates by some critics and underestimates by others. [3]

A Calcutta Corporation publication of 1806 reports highlighted that there were 2540 women in 593 brothels in 82 streets of Calcutta and they were tax-payers of about 6% of Calcutta's revenue. [4]

An estimated 85% of all prostitutes in Calcutta and Delhi enter the sex work at an early age. [5]

SOCIO- ECONOMIC CAUSES OF PROSTITUTION

The causes of prostitution include ill treatment by parents, bad company, family prostitutes, social customs, inability to arrange marriage, lack of sex education, media, prior incest and rape, early marriage and desertion, lack of recreational facilities, ignorance and acceptance of prostitution. Most of them enter involuntarily and then become a part of the system of exploitation. There are other social factors which are responsible for the degradation of woman status. One factor is that view of people about woman as commodity. Economic causes include poverty and economic distress. Poverty is one of the main causes which push woman towards prostitution. Economically depressed woman with low education level become victims of prostitution. Mass poverty during this period and people's subsequent adjustment activity aggravated several adolescents' antisocial behaviour, particularly in discriminate and clandestine social involvement. Female adolescents had to contend with the allurement of financial gratification and sexual overtures by relatively richer peers and adults. Consequently, poverty or the need to survive became the driving force and motivation behind the sexual activity of adolescent girls. [6]

Indeed, evidence from many developing countries suggests that poorer women are more likely to have non-regular partners and that condom use with non-regular partners is significantly lower among poorer women. [7] In this respect, attention has been drawn on the 'sugar-daddy' syndrome, whereby schoolgirls enter into sexual relationships with older, wealthy men who can assist them with school related expenses or the purchase of material goods. [8] The rising level of adolescent female sexual activity is also a function of the need to achieve or maintain an upscale life-style or for the longer-term objectives of establishing contacts with wealthy or prestigious people, and of obtaining assistance with finding a good job others use sex as a bargain for marriage or to prove their fecundity as a prelude or prerequisite for marriage. [9]

Marriage seasons, festivals and fairs are considered 'peak' seasons, while winter, summer and rainy seasons are considered 'lean'. Brothels close down for festivals such as Holi and Dusserah for Hindu and Ramzan and Muharram for Muslim FSWs in some cities. [10] Prostitutes who are known as call-girls are usually more educated and attractive than those living in brothels and are often engaged in some other occupation. [11]

In a subsequent study of nine call-girls in Delhi in 1993, Kapur found that some of them belonging to the upper-middle class were aware of AIDS and rejected clients who refused to use condoms. [12] At the other end of the spectrum which operates high-class escort girls recruited from women's colleges and the vast cadres of India's fashion and film industries. [13]

A major portion of what their clients pay has been shared by pimps, landlords, madams, financiers and

policemen. A survey conducted in a red-light area of Calcutta in 1987 found that 59% of prostitutes were abandoned by their husbands and many of them were originating in Murshidabad district, where young women in many poor families are expected to go into prostitution, remit a substantial amount of money (Rs. 475 per month, on an average) to their families. [14]

HEALTH CHALLENGES

Eighty percent of their clients were married. Many of them had suffered from sexually transmitted diseases (STDs) at one time or other and had experience of induced abortion but in general, they tried to take good care of their health by visiting physicians whenever necessary. Many of them wanted their clients to use condoms but most clients did not comply. A high proportion of their clients preferred oral sex to vaginal intercourse. The prostitution leads to many health problems for the prostitutes like- Cervical cancer, Traumatic brain injury, HIV, STD, Psychological disorders. Based on the materials collected during a study on risk factors associated with cervical cancer among prostitutes in Domjur, Howrah, West Bengal, report of Sociological Research Unit, Indian Statistical Institute, Calcutta explored various biosocial factors which may lead women to prostitution. [15]

In a country like India where most of the people indulge themselves in unprotected sex with prostitutes it is very difficult to eradicate the problem of aids. Historically, the AIDS epidemic in India was first identified amongst sex workers and their clients, before other sections of society became affected. The sex workers are themselves taking steps to combat with aids in some brothels in India for example sonagachi a brothel in Kolkata; where the sex workers are insisting their clients for use of condoms in order to avoid aids. The advent of AIDS has generated few empirical studies along with intervention programmes in red-light areas of few large cities. The findings of these studies corroborate the common knowledge that prostitutes, in general, lead a poor standard of life in dilapidated and unhygienic environments. [16]

A large proportion of them suffer intermittently from various kinds of STDs. Most of them are forced to enter this occupation because of adverse circumstances. Many prostitutes send a part of their income to their families. This study focuses on the health challenges faced by the female sex worker. It tells about the awareness about Sexually Transmitted Diseases (STD), awareness about the HIV, Problem during the sexual intercourse, place of treatment and health check-up. More than half of the respondents are aware about the STD but around same number of the respondents are not aware about the STD. It is expected that the entire female sex worker should aware about the Sexually Transmitted diseases. However it is found that more than 90% of the female sex workers are aware about the HIV. It is because here Non- government organization working with them and making aware them about HIV. about the problem during the sexual intercourse then more than half of the respondent replied that they face the pain during the sexual intercourse. Other respondents are also facing the problem like Lower Abdominal Pain and Itching and Reddening. Only 20% of the female sex workers responded that they are not facing any problem during sexual intercourse. Almost all the member takes treatment in the private hospital suggested by NGO. Majority of the female sex worker are checking their health per month. Less number of respondents does check up on weekly basis. Very less number of respondents checks their health half yearly. It seems that majority of them are aware about their health and regularly checking their health. Because of the strong prejudice against them they cannot take advantage of the government health facilities and have to depend mostly on local quacks who charge them exorbitantly for treatment and medicines. It is clear from the table that around half of the respondents are not aware about the STD, they are facing problem during the sexual intercourse though they are checking their health. All these discussion shows that there are several health challenges before female sex worker. [17]

LEGAL PROVISIONS TO CONTROL SEX WORKERS

The main law dealing with people in sex work is the Immoral Trafficking (Prevention) Act (ITPA) of 1986 which seeks to prevent trafficking of persons in India and prohibits most outward manifestations of sex work, including brothel operating and public solicitation. It also allows for eviction of sex workers from their residences in the name of "public interest." The 1986 Immoral Trafficking (Prevention) Act (ITPA) provides marginal benefits to prostitutes by prohibiting male police officers from searching them unless accompanied by two female police officers; and also by seeking to draw women away from prostitution through rehabilitation in Protective

Homes. However, a recent review of the conditions in a well-known Protective Home in Delhi indicates little success in meaningful rehabilitation of its inmates. [18]

The 1956 Suppression of Immoral Trafficking Act (SITA) assumed that prostitution was a 'necessary evil' and prohibited a prostitute from soliciting clients in public places and forced her to work in certain areas known as red-light areas, thereby exposing her to exploitation by pimps and others. Though the SITA did not aim to punish prostitutes unless they solicited, it gave enough powers to police and other government agencies to terrorize, harass and financially exploit a prostitute. Legislation regarding AIDS was introduced in the Rajya Sabha in 1989 which gave some government agencies sweeping powers to infringe the liberties of certain categories of people, but, owing to strong opposition by a few activist groups, it was withdrawn in 1992. [19]

CONCLUSION

The women engaged in the commercial sex work are always been stigmatized. Social and economic condition is responsible for the poor health status of women in commercial sex work. The commercial sex industry is a multibillion dollar Indian and global market which now includes strip clubs, massage brothels, phone sex, adult and child pornography, street, brothel and escort prostitution. For the vast majority of the world's prostituted women, prostitution is the experience of being hunted, dominated, harassed, assaulted and battered.. Recruitment of adequate number of trained counsellors and social workers in institutions/homes run by the government independently or in collaboration with non-governmental organizations. Awareness generation and legal literacy on economic rights, particularly for women and adolescent girls should be taken up. Adequate publicity, through print and electronic media including child lines and women help lines about the problem of those who have been forced into prostitution.

There is more research needed on savings-led microfinance and combined microfinance/vocational training interventions. Addressing gaps through further research and piloting will provide a major contribution to the state of the practice of HIV prevention for FSWs. Legalization of prostitution will decrease clandestine, hidden, illegal and street prostitution. Legalization of prostitution will protect the women in prostitution as they will have rights.

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REFERENCES

1. Nag M. Sexual behaviour in India with risk of HIV/AIDS transmission. Health Transition Rev 1995;5:293-305.
2. Ringdals NJ. Love for sale: A world history of prostitution. Grove Press: 2004.
3. Gilada IS. Women in prostitution in urban centres: Study perspectives and positional problems for social interventions. Paper presented to the NGO Forum of World Conference to Review and Appraise the Achievements of the United Nations Decade for Women: Nairobi; July, 1985. p. 5-26.
4. Ghosh M, Das NK. Anonder opekshay: Chondalika Ekdal Khokkosh Report on prostitution in Calcutta, in Bengali]. Kolkatta Development Dialogue: Kolkatta; 1990.
5. Mukhopadhyay KK. Girl prostitution in India. Soc Change 1995;25:143-53.
6. Isiugo-Abanihe, Uche C. 1993. Sexual Behaviour and Exposure to the Risk of AIDS in Nigeria. Faculty Lecture Series No. 8, Faculty of the Social Sciences, University of Ibadan, December 1993.
7. Filmer, D. (nd) 'Socioeconomic correlates of sexual behaviour: A summary of results from analysis of DHS data.' Background paper to Confronting AIDS. http://eurapa.eu.int /comm/ development/aids/limelette/tml/lim07.htm).
8. De Bruyn, Maria. 1992. **'**Women and AIDS in developing countries**.'** Social Science and Medicine, 34(3): 249-262.
9. Meekers, Dominique and Anne-Emmanuele Calves. 1997. 'Main girlfriends, marriage and money: The social context of HIV risk behaviour in sub-Saharan Africa.' Health Transition Review, Supplement to Volume 7: 316-375.
10. Mukherjee KK. Flesh trade: A report. Gram Niyojan Kendra: Ghajiabad; 1989. p. 44, 45, 81.
11. Nag M. Sexual behaviour in India with risk of HIV/AIDS transmission. Health Transition Rev 1995;5:293-305.

12. Kapur P. A study of changes in the sexual behaviour of call-girls and their clients in India. Paper presented at Workshop on Sexual Aspects of AIDS/STD Prevention in India. Tata Institute of Social Science: Mumbai; 23-26 November 1993. 13. Prostitution. From Wikipedia, the free encyclopedia. Available from: http://en.wikipedia.org/wiki/prostitution.

14. Ghosh M, Das NK. Anonder opekshay: Chondalika Ekdal Khokkosh [Report on prostitution in Calcutta, in Bengali]. Kolkatta Development Dialogue: Kolkatta; 1990.

15. Chattopadhyay M, Bandyopadhyay S, Duttagupta C. Biosocial factors influencing women to become prostitutes in India. Soc Biol 1994;41:252-9.

16. Gilada IS. No date: Prostitution in India: Causes, extent, prevention, rehabilitation. Indian Health Organization, Mumbai.

17. Umesh Gadekar Socio-Economic Status and Health Challenges of Female sex Workers of Miraj Town, India International Research Journal of Social Sciences ISSN 2319–3565 Vol. 4(6), 68-71, June (2015)

18. Agnes F. Review of a decade of legislation, 1980-1989: Protecting women against violence? Economic Political Wkly 1992;27:WS19-33.

19. Nag M. Sexual behaviour in India with risk of HIV/AIDS transmission. Health Transition Rev 1995;5:293-305.

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