(2) Data mining using several mathematical tools (logic and statistical methods) can give the actual picture regarding the illness. The trend of the illness could further be inferred using interactive and graphical systems.

Schizophrenia-diagnosis remains a challenge to the psychiatrists and psychologists because of a varied picture of the illness in the population at risk. Apart from differences in the core symptoms, socio-cultural and biological differences influence the varied picture further, to render a complex data tree and make the diagnosis more difficult. To solve the impending uncertainty of diagnosis, presently two guidelines are clinically followed: ICD (International Classification of Diseases) and DSM (Diagnostic and Statistical Manual) purely based on the Western data. Although modified from time to time, these guidelines are not sufficient enough to remove the apparent haziness because many other disorders, for example, manic-depressive, acute anxiety disorders, panic attacks or schizophreniform disorders are alike symptomatically and are often wrongly diagnosed as schizophrenia at first. Moreover, due to the prevailing adverse patient–doctor ratio, diagnosis is often based on manual skill without going into the details of ICD and DSM. Such manual diagnoses have often proved fallacious and the patient suffers. Therefore, according to Lucien Leape, Harvard School of Public Health, technology could help reduce such diagnostic errors.

Today's knowledge-intensive techniques of IT (primarily data engineering and artificial intelligence) are possibly the best handles to analyse such complex, varied data observed in schizophrenia-spectrum and obtain both macro-level as well as micro-level inter-relationships from it. Using these techniques for providing analytical tools to doctors and psychiatrists in the area of schizophrenia could be encouraging and later demanding. By using the secondary data sources, the above-mentioned tool can (a) identify different epidemiological factors (primary as well as secondary) behind the emergence of schizophrenia in the Indian scenario; (b) detect the actual '1st rank symptoms' in India weighing these epidemiological variables with each other, and (c) establish the 'probability' of illness-development in a person at risk by simulation studies. Diagnostic uncertainty or the error of misclassification could also be reduced. The database could be updated from time to time and a primary source could be used in future to enhance the skill of diagnosis using the tool.

This type of mathematically-based and empirically validated diagnostic criteria for patients in India would help the psychiatrists (a) to diagnose the population at risk for the development of illness in a considerably faster way, (b) to identify patients with early symptoms of schizophrenia, and (c) to exclude patients with schizophrenia-like disorders.

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Hepatitis C: a major health problem of India

Khaja *et al.*[1] have highlighted a major health problem due to hepatitis C virus (HCV) which accounts for one-fourth of all cases of chronic liver disease in India. It is estimated that there are 12.5 million HCV carriers in our country[2], and at least a quarter of them are likely to develop chronic liver disease in the next 10 to 15 years. In the absence of efficient anti-HCV screening among blood donors in our country, post-transfusion HCV-induced chronic liver disease is likely to increase. Also, HCV infection from other sources will continue to add to the disease pool.

Until the mid-1990s, interferon-2α (INF-α) was the only available treatment. The addition of ribavirin, a nucleoside analogue, substantially improved the response; however, viral genotype remains an important determinant of response rate[3]. Although cure remains the primary objective, the benefits of treatment are not necessarily restricted to those patients who achieved eradication of the HCV. It seems that interferon treatment alone or in combination may prevent progression of, or even reverse, hepatic fibrosis in infected patients even if cure is not achieved[4]. Although ribavirin alone does not seem to be active against HCV, the combination resulted in much improved and sustained biochemical, virological and histological response rates[5]. Recent studies have shown that long-acting pegylated interferon (modified form of interferon) have better viral response than standard INF-α preparations and in combination with ribavirin, achieved sustained viral eradication rates of 54–56% (ref. 6). In India, the percentage of sustained responders is quite high (50–60%). Such response of INF-α therapy in chronic hepatitis C is due to a predominant prevalence of hepatitis C genotype 3 in this region which is interferon-sensitive[7].

A short course (six months) of INF-α commonly led to transient normalization of serum alanine aminotransferase (ALT), loss of detectable virus in blood and reduction of inflammation in liver biopsies. Unfortunately, relapse occurred in most of these cases when treatment was stopped. No other treatment option was available for patients with chronic hepatitis C – thus, despite these modest responses, a six-month course of treatment with recombinant INF-α was approved by regulatory agencies in Europe and the US in the early 1990s. It was later shown that prolonging the duration of treatment with interferon for at least 12 months doubled the sustained response rate and this longer regimen was subsequently approved as the standard of care[6]. Due to the prevalence of hepatitis

C 3 genotype in India, a six-monthly treatment regimen is enough for eradication of HCV. However, non 3 genotype requires longer treatment duration.

Both interferon and ribavirin are not only expensive but can also have serious side effects. Interferon-based therapy is especially problematic in patients with psychiatric disorders such as depression. In fact, a history of severe depression or other psychiatric conditions is considered to be a relatively strong contraindication to interferon-based therapy, since dose-dependent and reversible neuropsychiatric effect occurs in 30 to 40% of patients during treatment[8]. In a developing country like India the cost of combinational therapy of interferon for chronic hepatitis C treatment may cost something around Rs 2.5–4.5 lakhs. Since a majority of the population is not covered by health insurance, financial constraints become a major obstacle for many patients to initiate therapy. As the chronic consequences of HCV infection are becoming more evident, public concern is escalating. Therefore, there is a need to explore the scope of cost-effective natural products with minimal side effects in the treatment of chronic hepatitis C.

Indigenous herbs and plants have received recent attention for the treatment of liver disorders. Certain plant products like Picroliv, Glycyrrhizin and *Phyllanthus amarus* have shown to have antiviral properties. In humans, particularly in patients with hepatitis B virus infection, these plant products have shown promising results with minimum side effects. Internationally, there are more than 600 commercial preparations with claims of liver protective activity. About 100 Indian medicinal plants are available as hepatoprotective formulations[9]. Table 1 lists few hepato-protective medicinal plants used for treatment of hepatitis.

Data on herbs used to specifically treat hepatitis C are sparse. Many studies evaluating the use of traditional medicine in the treatment of hepatitis were published before serological testing of hepatitis C became available. As a result, patients with hepatitis B and non A, non B hepatitis were included in the same study. In addition, there has been no publication of 'look-back' studies aimed at determining the number of non A, non B hepatitis that were actually due to hepatitis C[10].

Glycyrrhizin, a major component of the licorice root, *Glycyrrhiza glabra* or *Glycyrrhiza uralesis* has been found to have anti-viral properties through endogenous interferon induction as well as hepatocytoprotective effect[11]. Clinical trials using Glycyrrhizin among patients with chronic hepatitis C have demonstrated normalization or decrease in ALT values as well as histological improvement[12]. Glycyrrhizin has also been shown to inhibit RNA viruses through a hitherto unknown mechanism[13]. The Indian Council of Medical Research is now conducting a multi-centric, randomized, controlled clinical trial to evaluate the efficacy and safety of combined treatment regimens of interferon and Glycyrrhizin for the treatment of chronic hepatitis C.

Several other herbal formulations, viz. CH100, Sho-saiko-to (TJ-9), oxymatrine alkaloid isolated from Sophora root and 9–11 granules have also shown promising results in hepatitis C treatment. However, of concern is the side effect profile of certain herbs. Between 1995 and 1997, 66 patients treated with Sho-saiko-to have been reported to develop drug-induced interstitial pneumonitis and 55% of cases occurred in anti-HCV positive patients[10]. Anecdotal evidence and several small and inadequately controlled studies of herbal preparations as therapy of hepatitis C have suggested that these agents may be effective either in promoting recovery or in ameliorating the ongoing liver injury. Proper evaluation of these herbal preparations for treatment of hepatitis C requires immediate attention.

Table 1. Herbs used for treatment of hepatitis

Allium sativa (Garlic)
Aloe indica (Ghikanvar)
Andrographis paniculata (Kalmegh)
Boerhaavia diffusa (Punarnava)
Bupleurum falcatumz
Berberis aristata (Daru haridra)
Cichorum endivia (Kasani)
CH100
Curcuma longa (Haldi)
Camellia
Catechin
Chelidonium majus
Dictamnus
Duchesnia
Emblica officinalis (Amlaki)
Emblica ribes (Vidang)
Eclipta alba (Bhringraja)
Fumaris officinalis (Pitpapra)
Glycyrrhiza glabra (Yasgtimadhu)
Goou plus Yutan
Hu-chang
Luffa echinata (Bindaal)
Lithospermum
Lonicera
Phyllanthus
Picrorrhiza kurroa (Kutaki)
Piper nigrum (Kalimirich)
Piper communis (Erand)
Sho-saiko-to (TJ-9)
Silymarin (Milk thistle)
Solanum alatum
Sophora (Oxymatrine)
Tephrosia purpurea (Sharpunkha)
Tinospora cordifolia (Galo)
Withania somnifera (Asgondh)
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