

Question 1: Tell us the causes and cure of spinal pain according to you.

Answer: There are many causes of back pain. The most common cause is mechanical back pain in which the pain is due to stretched and weak muscles and ligaments. Sedentary life styles and improper posture, which have been mainly responsible for the substantially increased incidence of back pain, are the main factors contributing to mechanical back pain. Other high risk factors for back pain include professions requiring sedentary work /prolonged improper posture, obesity, stressful life style and previous history of back pain. Mechanical back pain could also be precipitated by injury, defects in the spinal anatomy or age related changes. Mechanical back pain is worse with activity and better with rest.

Back pain could also be due to infection. In the last decade there has been a rapid increase in the number of people getting tubercular infection of the spine in India and in other developing countries. This has been mainly due to decreased immunity of the population due to HIV and other causes. An infection would manifest with fever, loss of appetite and loss of weight in addition to the back pain.

Inflammatory back pain would manifest with pain associated with morning stiffness. In contrast to mechanical back pain, inflammatory pain is worse after rest and better with activity. It may also have associated involvement of other joints of the body.

Back pain can also be due to metabolic causes. The Asian population is especially predisposed to osteomalacia and osteoporosis. Spinal tumor is another cause for back pain.

It is important to understand that there are very few ailments which have a cure i.e. once treated the ailment would never occur again. Most of the ailments are managed. The same holds true for back pain.

Most episodes of back pain will last only a short time. Up to 75 % will recover in 3 months. There are two parts of management of back pain – taking care of the pain and reducing the chances of recurrence. Pain is managed by local application of heat / ice packs, massage, anti-inflammatory drugs, corsets, physiotherapy, acupuncture / acupressure or local injections. However these provide only temporary relief and are unproven to have a long term impact on the natural history of the disease.

Aerobic physical conditioning (through walks, swimming, treadmill, stair climbing, cycling and other general conditioning exercises), patient education and surgery are proven treatments which change the natural course of the disease. However, only 1-3% of back pain sufferers ever require surgery.

Removal of high risk factors, specific back exercises, physical conditioning exercises, proper posture in everyday activities and controlling any interfering psychosocial, professional or personal emotional factors are important for prevention of recurrence of back pain.

To summarize, back is most often mechanical in origin. It can generally be managed easily. The patient needs to be educated so that he / she can become the manager of his / her problem. Lifestyle changes are important to prevent back pain and to reduce the chances of recurrence.

Question 2: How many Indians suffer from back pain at some point in their lives?

Answer: Unlike in the West, where the epidemiology of back pain has been studied quite extensively, there is no good epidemiological study in India.

In a study done by Joshi TK, Menon KK, Kishor J, from centre for Occupational and Environmental Health, Government of NCT of Delhi, 631 workers from 60 factories representing small and medium-sized enterprises located in Delhi were interviewed. Many (59.4%) of the workers had musculoskeletal disorders. Tailors, those working near furnaces, cooks, workers in buffing, checking and assembly work, and those working with chemicals had the most joint complaints. Cervical pain was more frequent in tailoring and packing work, whereas lumbar pain was more common in buffing, operators working on presses, those using hand and power tools, and those lifting heavy manual loads. They concluded that the high prevalence of musculoskeletal disorders in workers needs urgent attention from the health and labor sectors. An ergonomic approach to prevention should be considered. The current manual load handling limits prescribed in the Indian Factory Rules potentially expose workers to back stress. Research is urgently required to determine the safe load handling limits for the Indian working population based on ergonomic principles.

Another study was carried out by Ramnarayan R Tiwari, Mrinalini C. Pathak and Sanjay P Zodpey, among 514 cotton textile workers of Sri Bapurao Deshmukh Sut Girni, Wardha to study the prevalence of low back pain. In the cross sectional study the prevalence of low back pain was found to be 11.1%. Of six study factors, except for family history of musculoskeletal disorders, the other five factors viz. age >35 years, obesity, smoking, duration of exposure >10 years and working position requiring prolonged sitting, were found to be significant risk factors for the development of low back pain. Age >35 years was found to have 9 times more risk as compared to <35 years. Thus they concluded that along with occupational risk factors, some non-occupational risk factors also play a role in the development of low back pain. Hence, while ergonomic principles should be used for controlling occupational risk factors, interventions should also be done to control non-occupational risk factors.

Even though there is no proper epidemiological study in India we could anticipate that the incidence and prevalence in India would be the same as in the Western Countries. Most of the predisposing factors are equally, if not more, prevalent in the Indian population as the lifestyles have changed predominantly.

Question 3: Is spinal-fusion surgery performed in our country? If yes, since when and how much does it cost? How many spinal-fusion surgeries are performed here annually? Who are the candidates?

Answer: Yes, spinal-fusion surgery is commonly performed in our country since quite a long time. As in the other countries, the spinal instrumentation used for fusion has shown a gradual evolution. Starting from the use of Harrington instrumentation, the use of Hartshill and Luque instrumentation and then of various other segmental hook rod or pedicle screw rod constructs has become popular. Minimally invasive techniques are now also being used for fusion. Various kinds of cages have also been used for the fusion process.

The cost of a spinal fusion surgery varies according to the type of implants used, whether a cage is used or not, whether Indian or imported implants are used and the type of services availed by the patient (general ward, shared room, single room or deluxe room). On an average with the Indian implants the expense on the fusion surgery would range from Rs. 65,000/- to Rs. 1,30,000/- whereas with imported implants the price could range from Rs. 80,000/- to Rs. 2,25,000/-.

Fusion surgeries are being done for various indications like Spondylolsthesis, spondylolysis and spinal instability (or surgeries which are likely to create instability in spine). In addition other conditions like Trauma, Scoliosis correction, Tumor surgery etc may also require fusion surgeries.

Though exact figures are not known, the number of fusion surgeries performed in India may be a less than that in the West and especially the US where around 300,000 fusion are performed annually.

Question 4: Is discectomy performed here? How many such surgeries are performed per year? Who are the candidates?

Answer: Yes discectomy is performed here. There are no statistics available for the number of discectomies done in India.

There is no clear consensus around the world on what are the exact indications for surgery; i.e. who are the candidates for surgery. To understand this clearly it may be useful to trace briefly the historical stages in management of lumbar disc prolapse.

The first stage was the "Clinical description of Sciatica". Hippocrates in 400 BC gave an early description of Sciatica. Cotugno gave an accurate description of sciatica versus hip disease in 1764. It was ultimately Goldthwait who proposed in 1911 that sciatica was due to a prolapse Intervetebral disc.

The next stage was the surgical description of prolapse Intervetebral disc by Mixter and Barr in 1934. This established the so-called "Dynasty of the disc". To the unsophisticated all leg pain was considered to be sciatica due to a ruptured disc, and the rush was on to excise the offending disc.

The next stage was the refinement of surgical technique by various experts. Verbiest, rejected by his Neurosurgical colleagues, but persistent to the point of publishing his work, brought attention to bony encroachment of nerve roots as a source of sciatic discomfort. The recent advances in computed tomography and magnetic resonance imaging and a better understanding of the causes of leg pain have presented spinal surgeons with the opportunity to make consistently accurate diagnosis of the patient's symptom producing disorders.

We are now entering the age of a new standard of surgery used to treat PIVD which is characterized by the following:

1. An accurate diagnosis of the pathologic condition as well as of its exact location
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2. Limited surgical intervention
3. Limited complications
4. An 85% success rate
5. Return of work rate of 95%

The goals of treatment of PIVD hence are early return of patients to normal activities, to avoid unnecessary surgery, efficient and precise use of diagnostic studies and to devise a treatment format that will make therapy available at an acceptable cost to society.

As such we quote literature, and present an evidence base as support for any claim. For surgical management of Lumbar Disc Prolapse, there have been 27 randomised, controlled trials so far, out of which 16 have been exclusively on chemonucleolysis, 11 on different surgical techniques, only 1 on surgical discectomy vs conservative management, 3 on outcomes of microdiscectomy vs standard

discectomy and 3 on percutaneous discectomy. Most of the studies have had major defects of design and some had a very small number of patients. Only 2 of the studies presented with 10 year results.

The only study that has compared surgical treatment of PIVD with any form of natural history, conservative treatment or placebo has been the one done by Henrik Weber in Norway. The conclusions of the study were that Discectomy was significantly better than conservative treatment at one year, but there were no significant differences in outcome at four and ten years. Regarding outcomes of treatment, impaired motor function had a good prognosis whereas sensory deficits remained in at least one half of all the patients.

However in addition to the accolades, there were many criticisms of the study as well. Since this was the only study of its nature, another effort was made to assess the relative efficacy and cost effectiveness of surgical and non surgical approaches in the treatment of common conditions associated with low back and leg pain. This trial, called the "Spine Patients Outcome Research Trial (SPORT)", is going on at 11 clinical centres in US. The implication of the outcome of such a trial can be understood from the fact that the National American Spine Society's Board of Directors published their position statement in the journal of Spine giving various suggestions on the deficiencies in the protocol of the study.

In a nutshell, we are still not clear from the literature as to what exactly are the indications for surgical and conservative management of PIVD.

Most studies have had many weakness of trial design and conclusions must be drawn with caution. Nevertheless it is possible to draw a number of provisional conclusions. Most lumbar disc prolapse resolve naturally with the passage of time and conservative management without surgery. There is considerable evidence that surgical discectomy provides effective clinical relief for carefully selected patients with sciatica due to lumbar disc prolapse that fails to resolve with conservative management even if there is no clear evidence that surgery alters the long term natural history or prognosis of underlying disease.

The indications for surgery in PIVD as mentioned in literature could be summarized as under:

- Increasing Neurological deficit: However it should be also noted that Weber had shown that patients with a significant neurologic lesion made as much recovery with non-surgical treatments as they did with surgical treatment
- Significant Neurologic deficit with significant straight leg raising reduction: Again, Weber has shown that these patients recovered just as well with non-surgical intervention
- Bladder and/or Bowel Involvement: Usually a sequestered disc that requires immediate surgical excision for best prognosis
- Failure of Conservative treatment – most common reason; no adequate relief with 6-12 weeks of conservative treatment & recurrence of sciatica generally do not respond well to conservative treatment

The choice of micro or standard discectomy at present probably depends more on training and expertise of the surgeon and the resources available, than on scientific evidence of efficacy. There is still a lack of scientific evidence on the optimal timing of surgery. There is strong scientific evidence to support the option of chemonucleolysis as a less invasive, intermediate stage between conservative management and open surgical intervention, although the overall results are poorer than those of primary discectomy. Until better scientific evidence is available automated percutaneous discectomy and laser discectomy should be regarded as a research technique.

The relative balance of possibly avoiding surgery, relative risks and complication rates, clinical outcomes over the next year or so and the potential impact on the lifetime natural history of disc trouble thus remains a matter of debate.

Question 5: Is it true many times, the precise cause of pain remains unknown as imaging tests have found that two people with herniated discs can lead radically different lives: one spends his days popping painkillers. The other dances through life.

Answer: It is well accepted that we do not have to treat images (MRI, CT-Scan etc) but the signs and symptoms of the patients. Although lumbar disc disease may well be a cause of low back pain, it is important to note that disc degeneration can occur in the absence of back pain or any other symptoms. Paajanen et al found that in 35% of healthy male volunteers significant disc degeneration was demonstrated on MR imaging. In a series of 600 autopsy specimens, Miller et al showed that 90% of all lumbar discs had evidence of degeneration in individuals by the age of 50 years.

Although degenerative disc disease is common in asymptomatic populations, large compressive lesions are uncommon. Patients with large compressive lesions are also generally believed to be more ideally suited to surgical intervention. These same patients, however are those most likely to experience spontaneous regression of their lesions and they have a high rate of clinical improvement with noninvasive treatments.

Hence we have to correlate the signs and symptoms with the history and come to a provisional diagnosis. There is no need to rush for all kinds of imaging tests immediately. Since the management remains the same except when there is severe progressive neurological deficit, imaging could be done only if the patient does not respond to a suitable trial of conservative treatment.

The fact that we still do not know the exact cause of pain in a case of PIVD further reinforces that imaging studies should be co-related with the history and the sign and symptoms. A patient may have severe leg pain and the MRI may reveal a significant PIVD. The patient may respond to conservative treatment. However the MRI subsequently may still show some amount of disc prolapse. It is thus obviously just not the mechanical pressure of disc on the nerve, which causes the pain. Though the exact cause is not known there are various hypotheses for the cause of the pain and the currently favoured ones are as under:

1. Pain in a case of PIVD is caused by release of certain chemicals, which irritate the nerve root. With passage of time as the release of chemicals reduces, the pain also subsides.
2. The pressure of the disc causes the nerve to be stretched. The resultant tension within the nerve causes the pain. With time the microfilaments which attach the nerve to the surrounding structures relax, thus, relieving tension in the nerves. This results in the pain to subside.

Clinical improvement following a symptomatic lumbar disc herniation does not necessarily correlate with the radiographically documented resolution of the herniation. Fraser, et al., performed a study in which they examined the MR imaging findings in patients who had undergone treatment for lumbar disc herniation 10 years earlier. Approximately one third of these patients had undergone a saline injection as a control treatment for the study of chymopapain as a treatment for lumbar disc herniation. Overall, a persistent herniated disc was found in 37%, and the incidence of persistent herniation was similar in patients treated with chymopapain, surgery, or saline injection. Interestingly, the presence or absence of persistent disc herniation had no significant bearing on outcome. Analysis of their findings indicated that long-term improvement of symptoms after treatment of a disc herniation may occur with or without resolution of the herniated disc.

Question 6: They have quoted a study by Dr Eugene Carragee saying that pain as much to do with the mind as it does with the body. And the best predictor of pain was not how bad the defect looked, but the patient's psychological distress. Depression and anxiety have long been linked to pain. And a recent Canadian study found that people who suffer from severe depression are four times more likely to develop intense or disabling neck or low-back pain. And at New York's Hospital for Special Surgery, psychiatrist Gregory Lutz says he often sees men who have two things in common: rip-roaring sciatica and an upcoming wedding date. The problem in their backs, possibly a degenerated or herniated disc, likely already existed, but was intensified by the premarriage jitters! Do you agree? Do Indian spine specialists find similar problems with their patients?

Answer: Though a particular stimulus may precipitate pain but various other stimuli contribute to the pain and its outcome. The psychological state of an individual contributes substantially to the threshold of the individual and thus the amount of pain that he/she perceives. The severity of pain in a particular individual may thus fluctuate according to the fluctuation in the psychological state of the individual. Generally pain (especially chronic pain) results in a certain amount of psychological distress or anxiety which in turn lowers the threshold of pain. This leads to increased perception of pain which in turn causes more psychological distress. This vicious cycle could itself result in the accentuation and / or perpetuation of the pain. The example of premarriage jitters leading to precipitation of an attack of sciatica can thus be explained. We see a large numbers of patients where a forthcoming important event like marriage, examinations, transfers etc cause jitters which then precipitates an acute episode of back pain with or without leg pain.

Further, for any pain which becomes chronic (generally accepted as pain that lasts for more than 3 months), a psychosomatic component invariably contributes to the chronicity. Thus in chronic back pain, which in particular is a major cause of medical expense, absenteeism and disability, the pain and disability are not only influenced by somatic disease, if found, but also be psychological and social factors. Chronic low back pain is not only a physical problem, but may also depend on patient's attitudes and beliefs, psychological distress and illness behaviors.

Since a large number of asymptomatic individuals have findings of degenerative changes in the MRI and since the changes on MRI may persist in a patient even after pain relief, images cannot predict pain. The fact that pain cannot be measured and that causes like muscle weakness etc cannot be documented with diagnostic tests, further compounds the matter. The best predictor of pain is thus a proper evaluation which includes signs of the patient properly correlated with symptoms (which are brought out by taking a good history). This would include a psychosocial evaluation as well. Since not all patients with back pain suffer from psychosocial problems it may be wrong to state that the patients psychological distress is the best predictor of pain in all cases. If the signs correlate properly with the symptoms, the two together may be a better predictor of pain. This would however incorporate the psychological distress component as well.

We see a large number of patients with chronic back pain in our practice with a substantial component of psychosomatic over lay. The patient may be a disgruntled house wife not getting adequate time and attention from the family members, or those with an unhealthy working environment, strained relationship, dissatisfaction with spouse etc.

One would be more inclined to rule out the psychosocial component in a patient in whom the description and intensity of pain do not co-relate with the clinical findings and the investigation. In such a patient a careful evaluation for signs and symptoms of sub clinical depression may be positive. Answers to questions like "Do you feel tired when you get up in the morning?" "Do you enjoy life as much as you did before?" "Have you become more irritable and loose your temper quicker than you

used to before?" may give a clue in this regard. A detailed evaluation could then be done by the psychologist.

In fact all patients advised spine surgery in the US are generally evaluated by the psychologist before the surgeon takes them up for the surgery. Unfortunately this practice has not percolated into India but surgeons who do not assess the psychosocial component properly or have it evaluated properly are unlikely to have good results.

The treatment is bound to show poor results unless the patient is managed comprehensively which includes the psychological management. Consequently, the treatment of chronic low back pain is not primarily focused on removing an underlying organic disease, but at the reduction of disability through the modification of environmental contingencies and cognitive processes. In general, three behavioural treatment approaches can be distinguished; operant, cognitive and respondent. Each of these focuses on one of these response systems that characterize emotional experiences, behaviour, cognition and physiologic reactivity.

Question 6 : Do surgeons here recommend alternative medicine? Do they work along with chiropractors, massage and rehab specialists, acupuncture to treat certain patients? Do you have these facilities in your hospital? Basically this is to emphasize the non-invasive approach to relieve back pain.

Answer: Although low back pain is a benign and self-limiting condition, many patients look for some type of therapy to relieve their symptoms and to provide them with hope for a cure. For this reason, it is possible to list more than 50 potential therapies promising to relieve the pain, lessen the suffering, and offer a cure for this problem. Alternative medicine is quite popular with the common people. In 1998 and 1999, almost 17% of the Canadian population aged 18 or older reported having sought the care of alternative health care practitioners in the previous year. In 1998, Wainapel et al surveyed an urban rehabilitation medicine out patient office in New York, addressing the use of alternative therapy and its perceived effectiveness. The results indicated that 29% of the patients had used one or more alternative medical therapies in the past 12 months, and the most common therapy used was massage. 53% of patients who used alternative treatments reported some degree of effectiveness. However, there is sound evidence for only a minority of these therapies.

Various surgeons have various thresholds for their patient seeking alternative medicine. I often refer patients for alternative medicine if they have not responded to conservative treatment and if they are not candidates for or are not eager to go in for the surgical option. Many of these techniques of alternative medicine have some scientific rationale for their use. However, many patients in India go to faith healers who use techniques which have no scientific rationale behind these use. I believe that the relief in pain is what is important for the patient as long as the process involved does not harm the patient. I have often seen patients in my practice who have not responded to various modalities and then have got relief from a faith healer who has treated them with bites by leeches or cutting a vein, letting the "bad blood flow out.

Such treatments do not have a scientific rationale at present but if they consistently give good results it may be worthwhile to try and find a scientific basis of the treatment through research. In fact when massage was first introduced, it was treated with sarcasm by various specialists but ultimately a scientific basis was found and the treatment has stood the test of time. However, I have also seen patients who have severe exacerbation of pain after untrained person has given a sudden jerk to the patient in order to treat the pain. We have facilities for massage naturopathy, acupuncture, homeopathy and yoga at our hospital.

Unfortunately in India we do not have a course in chiropractic. In US the chiropractors have a practice approximately six times that of the Orthopaedic surgeons (you may like to verify this data as it may not be precise). We can however find many self-styled chiropractors in India.

When an individual experiences pain or discomfort, the natural reaction is to rub or hold the affected areas to reduce the sensation. The English word "massage" is derived from the Arabic word "mass'h," which means to press gently. At its most basic, massage is a simple way of easing pain, while at the same time aiding relaxation and promoting a feeling of well-being and a sense of receiving good care. Soft tissue massage is thought to improve physiologic and clinical outcomes by offering the symptomatic relief of pain through physical and mental relaxation and increasing the pain threshold through the release of endorphins. The gate-control theory predicts that massaging a particular area stimulates large diameter nerve fibers. These fibers have an inhibitory input onto T-cells (which within the spinal cord are the first cells that project into the central nervous system). T-cell activity is depressed (whereas, conversely, small-diameter nerve fibers [nociceptive fibers] have an excitatory input), and pain relief follows.

Massage is recognized as a safe therapeutic modality, without risks or adverse effects. However, there are contraindications, such as applying massage over an area with acute inflammation, skin infection, non-consolidated fracture, burn area, deep vein thrombosis, or active cancer tumor.

Massage might be beneficial for patients with subacute and chronic nonspecific low back pain, especially when combined with exercises and education. Evidence suggests that acupuncture massage is more effective than classic massage, but this needs confirmation. More studies are needed to confirm these conclusions, to assess the effect of massage on return-to-work, and to measure longer term effects to determine cost-effectiveness of massage as an intervention for LBP.

Acupuncture, one of the oldest forms of therapy, has its roots in ancient Chinese philosophy. Traditional Chinese medicine is based on a number of philosophical concepts, one of which postulates that any manifestation of disease is considered a sign of imbalance between the yin and yang forces in the body. In classical acupuncture theory, it is believed that all disorders are reflected at specific points either on the skin surface or just beneath it. Vital energy circulates throughout the body along the so-called meridians, which have either yin or yang characteristics. A correct choice for needling among the 361 classical acupuncture points located on these meridians is believed to restore the balance in the body.

When the needles have been placed successfully, the patient is supposed to experience a sensation known as *tech chi*, defined as a subjective feeling of fullness, numbness, tingling, and warmth with some local soreness and a feeling of distension around the acupuncture point. There is no consensus among acupuncturists about the necessity of reaching the *chi* for acupuncture to be effective. In addition to needling, acupuncture often includes techniques such as moxibustion and cupping.

Since acupuncture was disseminated to the West several hundred years ago, many different styles of acupuncture have developed including Japanese meridian therapy, French energetic acupuncture, Korean constitutional acupuncture, and Lemington 5-element acupuncture. Although these are similar to traditional acupuncture, they each have distinct characteristics. In recent decades, new forms of acupuncture have developed such as ear (auricular) acupuncture, head (scalp) acupuncture, hand acupuncture, and foot acupuncture.

Modern acupuncturists use not only traditional meridian acupuncture points, but also nonmeridian or extra meridian acupuncture points, which are fixed points not necessarily associated with meridians. Acupuncturists also use trigger points, which have no fixed locations and are found by eliciting tenderness at the site of most pain.

Acupuncture commonly includes manual stimulation of the needles, but various adjuncts often are used in modern forms of the therapy including electrical acupuncture (with an electrical stimulator connected to the acupuncture needle), injection acupuncture (with herbal extracts injected into acupuncture points), and acupuncture with moxibustion (the burning of the moxa herb, *Artemisia vulgaris*, at the end of the needle).

It is still not clear what exact mechanisms underlie the action of acupuncture. According to traditional Chinese medicine, acupuncture promotes the flow of qi (life force energy), thereby balancing the human body system. Western scientific research has proposed mechanisms for the effect of acupuncture in relieving pain. It has been suggested that acupuncture might act according to principles enunciated by the gate control theory of pain. One type of sensory input (low back pain) could be inhibited in the central nervous system by another type of input (needling). Another theory, diffuse noxious inhibitory control (DNIC), implies that noxious stimulation of heterotopic body areas modulates the pain sensation originating in areas where a subject feels pain. There also is some evidence that acupuncture may stimulate the production of endorphins, serotonin and, acetylcholine in the central nervous system, enhancing analgesia.

Evidence based review show that there is no evidence showing acupuncture to be more effective than no treatment. There was moderate evidence indicating that acupuncture is not more effective than trigger-point injection or transcutaneous electrical nerve stimulation, and there is limited evidence that acupuncture is not more effective than placebo or sham acupuncture for the management of chronic low back pain. Hence systematic review does not clearly indicate that acupuncture is effective in the management of back pain.

Question 7: Would you have an anecdote of a man in his 40s who lifts something heavy and gets two herniated discs? He tries everything wacky before coming to your hospital. Faith healing to everything wacky possible. Today he practices biofeedback and gets cortisone shots three times a year to numb the pain. Biofeedback does not rid the pain, but at least offers some relief.

Answer: We have numerous anecdotes of patients who had all sorts of treatment at various places but have still been suffering from back pain for a very long time. In some of them pain got relieved for a while as they took the treatment but recurred again subsequently. However it is important to understand that taking care of the pain is only one part of the treatment, the other part being removal of the causative/predisposing factors. It is logical that unless we remove the causative/predisposing factor, back pain will only be temporarily relieved as long as the pain is suppressed and will keep recurring subsequently.

A comprehensive evaluation involves taking a detailed history, in which any such causative/predisposing factors also need to be brought out. Most of these patients with chronic pain not responding to treatment have responded just to taking care of these factors. These factors could be subdivided into mental stress or psychosocial factors and other predisposing/causative factors.

Biofeedback has been used in Latin US and Europe for management of chronic pain and other condition which are made worse by mental stress. Even though we have the equipment for biofeedback and use it for management of patients with neurological deficit, we do not use it for back pain management.

Scientists are not able to explain exactly how or why biofeedback works. However, there does seem to be at least one common thread: most people who benefit from biofeedback have conditions that are brought on or made worse by stress. For this reason, many scientists believe that relaxation is key to successful biofeedback therapy. When a body is repeatedly stressed, internal processes like blood

pressure become overactive. Guided by a biofeedback therapist, a person can learn to lower his or her blood pressure through relaxation techniques and mental exercises. When a person successfully relaxes and lowers his or her blood pressure, the feedback signals reflect this accomplishment. This acts as affirmation and encouragement for the person's continued efforts.

I believe that these patients can get equally good if not better results through reassurance by the treating physician, proper patient education and good psychosocial counselling and management.

I am not aware of any studies carried out in this regard, but it has been my observation that the Indian community is able to cope with stress full conditions better than in the West. This may be due to various reasons but the prominent amongst them may be religions beliefs (especially the Doctrine of Karma which helps people accept disease or disability better since they either attribute it to their sins in the previous birth or are able to seek comfort from the notion that they would have a better life in their next birth) and a strong family support system. This may be also reflected from the fact that whereas the incidence and prevalence of psychological and psychiatric problems in US is very high, it is quite low in the Indian population.

Hence I have found in my practice that if the patient and the family members are educated properly as to how stress may be contributing to their chronic back pain and what needs to be done in this regard, the patient is often able to manage the problem through various means like spiritualism, meditation and self empowerment with the support from the family as well as psychologist and / or psychiatrist where required.

It is important to point out that in this current era bad postures, sedentary life style, professions requiring long hours of desk job, computer related professions (there is no computer terminal available at present which allows maintaining a proper posture) and over weight are some of the other most common predisposing factors. The technological advances in this new era has resulted in all the conveniences, which have also been responsible for removing most of the manual work in day-to-day activities. The non-availability of these luxuries were probably responsible for the low incidence of back pain a few decades ago when the normal life style incorporated enough exercises in day-to-day activities.

I would also like to point out that cortisone is just one of the means to manage pain. It could be used locally at trigger areas or epidurally for leg pain in prolapse Intervetebral disc. We generally do not prefer to give more than 3 or 4 epidural injections. Similarly we do not prefer to repeal local cortisone injections too frequently. After managing pain (and cortisone injections could be one of the steps in the algorithm of pain management) we would prefer to the prevent / reduce recurrence through removal of predisposing/causative factors.

Question 8: I would like to know if, in India, the following is being done by doctors. They have mentioned Dr David Eisenberg, head of the Harvard Medical School's Osher Institute who is trying to figure out along with 20-odd specialists to diagnose and treat back pain. The goal is to see if there is a more efficient multidisciplinary way to attack the problem, and to make it cost-effective too. And these doctors believe that if patients' attitudes can help the pain, can more creative thinking among the experts improve the odds of beating it?

Answer: I totally agree that a multidisplinary team approach is vital for management of patients with back pain, especially those with chronic back pain. In fact this concept has been advocated for quite some time now. Education, exercise, and body positioning have been used as a treatment for low back pain for hundreds of years. Not until the middle of the twentieth century, however, did modern

medicine begin to formulate structured educational and exercise programs for a large number of patients.

By 1960 some physicians, such as Fahrni, had specialised researched, and formulated conservative care programs for their patients. In the 1960s Sweden was one of the most active areas of spinal research in the world. Back education was provided at the Volvo factory outside of Goteborg and was referred to as back school. Later, one of the most significant articles in the literature was written from that experience. In the early 1970s other physicians, as a result of their growing interest in spinal problems, developed back schools in their areas of the world. By 1980, there were hundreds of back schools throughout the world, and now there are thousands.

There is no single formula by which all back schools operate. The specific needs of therapists trainers and physicians have led to a wide variety of back schools. The only common denominator among all of these schools seems to be education. Some provide education only and no exercise training, others are primarily exercise programs, some providing large and expensive exercise machines and little or no education, except for perhaps a booklet or videotape on proper back health care.

In the scientific literature there is little agreement as to what should be taught in back schools. So many studies on low back pain have been performed that one can validate almost any personal point of view and thus validate the philosophy of any back school. However, some agreement and a common approach to education and exercises exist in most back schools.

We also manage chronic back pain through a multidisciplinary team. The team constitutes of the following disciplines:

1. Orthopaedic surgeon/physiatrist - Does a detailed evaluation including taking proper history, examination of the patient and prescribing necessary diagnostic tests. The same doctor could prescribe the necessary medication and co-ordinate the management of the patient with the support of other members in the multidisciplinary team. He/she is generally also responsible for patient education.
2. Pain Physician/Anesthetist – for suitable blocks, local steroid injections, transforaminal/inter-laminar epidural injections etc when conservative treatment fails.
3. Physiotherapist – For pain relief with various modalities like IFT, TENS and other forms of heat therapy, posture counselling, counselling for general conditioning, resistive and stretching exercises.
4. Occupational Therapist – To work upon various postures and positions in which the pain is minimum and suggest simple biomechanical principles, which would put the least stress on back for any particular activity.
5. Orthotist - For any Brace to be used temporarily if the patient gets relief with it size and till the pain becomes bearable.
6. Acupuncturist - For acupuncture.
7. Psychologist - For taking care of psychosocial components
8. Yoga therapist
9. Naturo-path – Work upon patients who are comfortable with such therapy.
10. Vocational Counselling - To suggest suitable changes in the vocation if required.
11. Social Worker – To mediate with the employers for job related issues.
12. Spiritual Counsellors – to explore ways to minimize any psychosocial component and to empower them to accept any chronic disability due to the pain.
13. Spine Surgeon – if any surgery is required.

The multidisciplinary team is often involved in providing group therapy to chronic patients but only after they have been worked up individually. Patients' education classes are taken by various members of the team with a goal of making the patient well versed with all aspects of back pain so that he/she could become the manager of his/her own problem. The team meets weekly to discuss all patients. Management is done according to a protocol which could be modified for individual patients in order to achieve the best results in a cost effective manner. It must be pointed out that different people have different requirements with regard to day to day activities and hence goals would need to be planned accordingly for each patient.

Question 9 : Then Dr John Sarno of the NYU school of medicine has been quoted saying how repressed rage and anxiety over your parents' divorce, sexual abuse, trouble at work can stress the body and manifest itself as muscle spasm, nerve dysfunction, numbness and pain. Is there any similar study being done in India.

Answer: As mentioned in the reply to the question no. 5 psychosocial problem could manifest with various problems like muscle spasm, pain etc. However I am not aware of any good study in this regard in India.

Question 10: As always, I want your comments about the ailment. Your reading into the problem and your studies/papers, if any.

Answer: I have put my comments about the ailment along with the answers to most of the questions. Even though a large chunk of my practice is on back pain, I have not documented these findings like most of the Indian clinicians. However your questions have stimulated me to document and publish my work as there is a paucity of data from the Indian population.

Question 10 : The article also talks about the new development of artificial cobalt-chrome disc. In Oct 2004, the American FDA approved the first such disc for patients with degenerative disc disease. Has this come to India yet?

Answer: The Bryan Cervical Disc for Cervical Disc Replacement has been available in India for the last 3 years. Prodisc, another cervical disc implant is also now available. The Maverick lumbar disc is also scheduled to be launched in India shortly. We have done a series of Brian Cervical Disc Replacements and hope to start with lumbar disc replacement as it becomes available in India.

Question 11. What are the possible medical problems that one would witness after performing wrong yoga postures? Are spinal problems the only kind of problems that one could witness?

Answer: If not properly done, yoga, or as a matter of fact (any kind of exercise), can lead to several problems. Muscle strain, especially back strain is the most common such injury. However the strain could be in any part of the body. In extreme cases it could even lead to fractures, especially if the bones are osteoporotic or weak. It could also aggravate some preexisting ailments, like osteoarthritis, or precipitate cardiac problem like angina in people who are predisposed.

Some yoga poses can even lead to adverse gastric problems in some individuals. In some rare conditions wrongly done yoga can adversely affect the individual mentally and lead to what is known as the "Kundalini Syndrome". The possible side effects on kundalini syndrome are pseudo death, psychosis, pseudo psychosis, confusion, anxiety, panic attacks, depression, sadness, suicidal thoughts, urges to self-mutilate, homicidal urges, arrhythmia (irregular heart beat), exacerbation of prior or current mental illness, insomnia, inability to hold a job, inability to talk, inability to drive, sexual pains, temporary blindness, and headaches.

Question 12 : What is your advice to those who plan to start practicing yoga?

Answer: Young people without any medical problems could start practicing yoga gently and gradually build up upon it. For older people or for those with pre-existing medical problems, it is always advisable to get themselves checked by a physician and to start practicing yoga under supervision. It is also advisable to warm-up before yoga or any kind of exercise and to follow a proper technique. It is equally important to cool down and stretch after yoga.

Question 13 . What is the most common problem that people face in such cases?

Answer: The most common problem that people could face in such cases would again be muscle strain and exacerbation of pre-existing conditions.

Question 14 : How does one tackle if they face such situations?

Answer: Depending on the situation, the individual should be able to tackle it accordingly. For example, if some serious pre-existing ailment (e.g. angina) gets precipitated, the individual should immediately be rushed to the nearest appropriate medical facility. However for milder conditions like mild strains or exacerbation of osteoarthritis, one could try to manage it with ice-packs, anti-inflammatories etc. and report to the doctor if there is no improvement.

Question 15 : Can everyone practice yoga? Is there any age-limit?

Answer: Yoga can be practiced by everyone. However the asanas may need to be tailored according to the age group that the individual belongs to. This is especially relevant to the elderly patients or for those with pre-existing ailments.

Question 16 : Who are the one who should avoid practicing yoga?

Answer: Those with very serious pre-existing ailments or those with very severe osteoporosis should avoid practicing yoga.

Question 17 :-I am suffering from Adult Scoliosis. Could you guide me with regard to the management?

Answer: Since you say that you are suffering from adult scoliosis, I presume that you came to know about the problem after the age of 18. However you have not mentioned about the angle of your curve. When viewing the back directly from behind, the spine is straight, the shoulders are even, hips are level and the distance between the arms and the body is equal. Scoliosis is defined as an abnormal lateral curvature of the spine with an angle 10 degree or more. This angle is known as the Cobb's angle and if you ask your doctor, he will let you know the angle of your scoliosis. The more the angle, the more severe is the curve and the more the chances of it being symptomatic. If the angle is more than 45 degrees the curve progresses with age. The curves in adult scoliosis tend to be more rigid / stiff, severe and progressive as compared to the curves in childhood scoliosis.

You will need to be evaluated in order to find out the cause of your scoliosis. Your scoliosis may have been since your childhood, but may have been noticed in your adult hood. 85% of all cases of childhood scoliosis have no known cause and are referred to as idiopathic scoliosis. Those which have a defect in the bone since childhood are known as congenital scoliosis. Other types of adult scoliosis can be degenerative scoliosis (caused by degenerative changes in the spine with ageing),

post traumatic scoliosis (caused by fracture of the spine) and neuromuscular scoliosis (caused by weakness of the muscles as in poliomyelitis, muscular dystrophies, spinal injury etc.).

We will also need to know more about your symptoms due to scoliosis. Back pain is often main presenting complaint as apposed to childhood scoliosis which present mainly with a cosmetic deformity. Pain radiating down the legs and / or weakness in the muscles, can also be seen in some types of adult scoliosis like degenerative scoliosis.

Once we have the results of the evaluation as above, we should be able to guide you as to whether you will have problems related to your adult scoliosis. If your curve is more than 30 degree and you have associated symptoms like back pain, you are likely to be bothered by back pain which may gradually increase with the angle of the curve. If you have been relative scoliosis, you may also have get pain radiating down the legs. This pain in the legs classically comes when you walk, increases as you walk further and may force you to stop walking after a particular distance. The distance that you can walk can progressively reduce with age. In severe cases people can hardly walk a few meters and there can also be associated weakness in the legs and loss of bowel / bladder control.

Adult scoliosis is initially managed conservatively with anti-inflammatories, physiotherapy, muscle strengthening and general conditioning exercises. In severe cases not responding to conservative treatment and interfering with lifestyle, surgical options are considered.

Question 18 : - What are the common sleeping habits/ patterns that aggravate back problems?

Answer: An important aspect which aggravates back problems is the posture in which people lie down in the bed, whether to sleep, read or watch television. If we look at the back bone from the front it is straight. However if we look at it from the side it has curves – a curve forward in the neck, backward in the upper back and forward in the lower back. If people lie down in a slouched position with the support of back rest or multiple pillows, the ligaments and muscles of the back get stretched since the normal curves of the back are either obliterated or exaggerated. This stretch of the muscles and ligaments results in back pain or neck pain. Hence we should not slouch in the bed for reading, watching television or sleeping.

Also, it is important that the mattress should not sag. A sagging mattress also stretches the muscles and ligaments.

Question 19 : What kind of mattresses do doctors recommend for people with back problems?

Answer: Mattresses available in the market include foam (body conforming foam mattresses are Tempur mattresses), hard (Futon), spring, water and air mattresses. There is very little good quality published evidence supporting the use of any particular of these products. Hence doctors recommend mattresses for people with back problems based on their own experience or knowledge.

Question 20 : Is there any specific brand that is favoured? For e.g. Tempur mattresses

Answer: There doesn't seem to be a consensus amongst the doctors will regard to kind of mattresses. However many Indian doctors tend to recommended hard mattresses to patients. The general view prevalent within the Indian population also is that hard surfaces for sleeping are better for people with back pain.

Question 21 : What should people suffering from back problems keep in mind when choosing mattresses?

Answer: As mentioned before, there is dearth of evidence supporting the use of any particular kind of mattress for people suffering from back problems or for the normal people to prevent back problems. A study by Carol Hagino, J Can Chiropr Assoc 1997; 41(1), found a kind of foam mattress to be useful in reduction of pain severity in back pain patients. Another study by Bergholdt K et al, Spine (Phila Pa 1976. 2008 Apr 1;33(7):703-8, found that foam and waterbed mattress' did influence back symptoms, function and sleep more positively as apposed to the hard mattress, but the differences were small. However another study by Koul PA et al, J assoc Physician India, 2000 Sep;48(9):901-2, found that sleeping on foam mattress was associated with the appearance of backache in medical residents which was reproducible and got relieved after using regular cotton mattresses. However its pertinent to note that none of these studies were a randomized clinical trial. Due to weaknesses in trial design we can't conclude anything from the available evidence based.

As per my experience we can't generalize as to what kind of sleeping surface would suit individuals. Some individuals get relief by sleeping on a hard surface whereas in others the hard surface may aggravate the pain and a soft surface suits better. Hence I ask patients to find out by trial and error as to what kind of surface suits them better and than go in for that particular kind of mattress.

I also counsel them on a proper posture while lying down. They are also informed to change the mattress as soon as it sags down.

Question 22 : What is osteoporosis? What are its symptoms?

Answer: Osteoporosis is a systemic skeletal disease characterizes by low bone mass and micro-architectural deterioration of bone tissue with a consequent increase in bone fragility and susceptibility to fracture. Osteoporosis is a generalized reduction in bone density that results when the rate of bone resorption exceeds the rate of bone formation. It is most commonly associated with the aging process in which the bone formation generally proceeds at the normal rate but bone removal occurs at an increased rate. Under abnormal conditions the reduction in bone density may represent the failure of the protein matrix in which the calcium is laid down. Osteoporosis thus is a disturbance of tissue metabolism, not calcium metabolism. Not enough matrix is laid down by osteobalsts (bone cells), but whatever is formed is calcified.

Osteoporosis generally remains silent and suddenly presents with a fracture. The bones commonly affected are the ones which suffer the most strain. Fractures are most common in the vertebra resulting in wedged vertebra. This wedging can make the back start curving and have a "hunched" deformity. This not only looks ugly, it also makes breathing difficult. It lowers the height and causes the abdomen to bulge. The second most common site of fracture is the hip. These fractures can be slow to heal or recur if osteoporosis is not treated. The other symptoms thus can be

- Neck becomes weak and head falls forward
- Hunched back
- Loss of height
- Pain in part or in whole of back
- Breathing difficult
- Stomach bulges because of the loss of space under the ribs
- Fracture
- Depression

Question 23 : How is it different from Osteoarthritis?

Answer: Osteoarthritis / Osteoarthrosis (OA, also known as degenerative arthritis, degenerative joint disease, arthrosis or in more colloquial terms "wear and tear"), is a condition in which low-

grade inflammation results in pain in the joints, caused by wearing of the cartilage that covers and acts as a cushion inside joints. Thus while osteoporosis involves the bones, osteoarthritis is a degenerative involvements of the joints.

Question 24 : Why are women more prone to it - are there any stats on how many women in India are probably affected by?

Answer: As per US statistics one out of every two women and one in eight men over 50 will have an osteoporosis-related fracture in their lifetime.

Many factors control the activity of the tiny cells in our bones. One of the most important factors our hormones. In women, the hormones go through many changes throughout life. Between the age of 45 to 60, women reach a stage called menopause. This is when their monthly period stops completely. This is caused by a major change in some hormones. This change affects their bones too. The cells which remove bone substance become over- active. They slowly eat away healthy bones and make them osteoporotic.

As far as I am aware there has been no proper epidemiological study on Osteoporosis in the Indian population. The only authenticated published literature that could be quoted is the book "Osteoporosis" by Dr. Balu Sankaran.

In his study the incidence of fracture of neck femur and Intertrochanteric fractures in two public hospitals (LNTP Hospital-499 cases from May 1998 to December 1999 & Safdarjung Hospital – 413 cases from December 1997 to December 1999) and one private hospital (St. Stephen's Hospital – 919 cases from December 1986 to December 1999) in Delhi was analysed. The percentage of fracture of neck of femur above 40 years was 52% in males and 48% in females. In the case of Intertrochanteric fractures above the age of 40, males accounted for 64.6% and females 35.4%.

These values are significantly different from the incidence quoted in the Western literature where post menopausal Osteoporosis is the major cause of a larger number of fractures in women than in men. It was also noted in Dr. Sankaran's study that the highest incidence of fractures of neck of femur occurred in the 51-60 years age group in males and 61-70 years age group in females. In the case of Intertrochanteric fractures, the largest incidence was in the age group of 61-70 years.

This study cannot be taken as a conclusive study. It however suggests that a larger study should be done in the Indian population.

Our experience at ISIC also suggests that hip fractures occurs at an earlier age in Indian population than in the West and that there is a higher male to female ratio suggesting that the Indian males are at a higher risk for hip fractures.

It is commonly believed that the Indian population has a lower bone mass. A proper epidemiological study may hence reveal that osteoporosis is widely prevalent in India and that osteoporosis fractures may be a common cause of morbidity and mortality in adult Indian men and women.

The reasons for these differences in the Indian population are not known. It is possible that dietary habits lead to a dietary deficiency of calcium since childhood leading to a lower peak bone mass and consequently osteoporosis at an earlier age. In addition, a dietary deficiency of Vitamin D may lead to Osteoporosis without causing osteomalacia. It may also be possible that the activities of daily living of women in India, especially in the rural areas where 75% of the population lives, is very different from that of the Western world.

Question 25 : From what age should women start becoming aware/careful/worried about osteoporosis?

Answer: Osteoporosis results if the bone stock is deficient. Thus neglect of any point of time can result in reduced overall bone stock and predispose to osteoporosis. Thus in general we should be aware about it through out our life time. However if there are some risk factors for osteoporosis we should be more careful. The risks factors are as under:

Risk factors that cannot be changed:

- ❖ Gender – Your chances of developing osteoporosis are greater if you are a woman. Women have less bone tissue and lose bone more rapidly than men because of the changes involved in menopause.
- ❖ Age - The older you are, the greater your risk of osteoporosis. Your bones become less dense and weaker as you age.
- ❖ Body size – Small, thin-boned women are at greater risk.
- ❖ Ethnicity – Caucasian and Asian women are at highest risk. African-American and Latino women have a lower but significant risk.
- ❖ Family history – Susceptibility to fracture may be, in part, hereditary. People whose parents have a history of fractures also seem to have reduced bone mass and may be at risk for fractures.

Risk factors that can be changed:

- ❖ Sex hormones: abnormal absence of menstrual periods (amenorrhea), low estrogen level (menopause) and low testosterone level in men.
- ❖ Anorexia.
- ❖ A lifetime diet low in calcium and vitamin D.
- ❖ Use of certain medications, such as glucocorticoids or some anticonvulsants.
- ❖ An inactive lifestyle or extended bed rest.
- ❖ Cigarette smoking.
- ❖ Excessive use of alcohol.

Most common risk factors:

- Advanced age
- Sedentary lifestyle
- Low calcium intake
- Early menopause

In general women without any risk factors should be more careful in the perimenopausal period

Question 26 : What should they do to stop it/ contain it? From what age?

Answer: The following can be done to prevent osteoporosis:

- Encourage Balanced diet rich in calcium & vitamin D
- Encourage weight-bearing exercise
- Encourage Bone density testing and medications when appropriate
- Avoid Smoking
- Avoid Excessive caffeine
- Avoid Alcohol
- Consuming more than 7 drinks per week is associated with greater risk of:

- low bone density
- falls
- fractures

There is no specific age at which one should start with the measures for prevention as this is a life long process.

Question 27 : Some drugs are known to increase the chances of osteoporosis - like Eltroxin; are there any other drugs or diseases that may make you more prone to osteoporosis?

Answer : Other drugs which are known to predispose to osteoporosis are as under:

- Antiepileptics (Phenytoin)
- Glucocorticoids
- Chronic anticoagulant use (Coumarin, Heparin)
- Immunosuppressants (methotrexate or cyclosporin)
- Gonadotropin releasing hormones analogues (used to treat endometriosis)

Question 28 : If you discover that you have osteoporosis is there some way to reverse it? To halt it? Or stop it completely?

Answer: Osteoporosis is managed as under:

The goal of osteoporosis management is to prevent fragility fractures. This could be done through non pharmacological treatment and drug treatment. Non pharmacologic prevention and treatment is of significant value and should be used in all patients. Adequate calcium & vitamin D supplements should be given. Exercise improves bone mass, improves muscle strength, coordination and balance, removal of predisposing factors, dietary management, limit alcohol consumption and fall risk evaluation and fall prevention.

Therapeutic options for osteoporosis include inhibitors of bone resorption like Bisphosphonates, Alendronate, Etidronate, Risedronate, Calcitonin, estrogen ± progestin, selective estrogen receptor modulators (SERMs) and Raloxifene. It also includes stimulators of bone formation including parathyroid hormone (Teriparatide).

Patient selection for treatment with pharmacologic therapy includes all patients who have had a fragility fracture, patients with a T score <-2.0 on central bone densitometry and patients with a T score < -1.5 on central bone densitometry, if they have one or more additional risk factors for fractures.

It is difficult to reverse the changes of osteoporosis. However newer drugs like Teriparatide have an anabolic action and may reverse the changes.

Question 29 : How does Osteoporosis affect the bone structure?

Answer: Osteoporosis results when rate of bone resorption (breakdown) exceeds rate of bone formation. It does leads to a generalized reduction in bone mass and bone quality.

Question: Why does it cause people to lose inches in height?

Answer: People loose height due to gradual wedging of the vertebrae due to micro fractures.

Question 30 : If you have osteoporosis and have broken a bone, what are the chances of it healing? Can anything be done to increase bone density at this stage?

Answer : The healing of a fracture in osteoporotic bone is delayed. However the general principles of management of osteoporosis are applicable.

Question 31 : Does bone density leach from the entire skeleton equally or are some areas more fragile than others because of osteoporosis

Answer : Some areas are more prone to osteoporosis and osteoporotic fractures. These areas are the vertebrae, the hips and the wrists.

Question 32 : Is it possible to have both osteoporosis and osteoarthritis? What can be done?

Answer: Since osteoporosis and osteoarthritis are common in the elderly, many patients will have both of them. Both the diseases need to be managed independently.

Question 33 : You had said in your notes that “a dietary deficiency of vitamin D may lead to osteoporosis without causing osteomalacia”. What is osteomalacia?

Answer : Osteoporosis is a generalized reduction in bone density that results when the rate of bone resorption exceeds the rate of bone formation. It is most commonly associated with the aging process in which the bone formation generally proceeds at the normal rate but bone removal occurs at an increased rate. Under abnormal conditions the reduction in bone density may represent the failure of the protein matrix in which the calcium is laid down. Osteoporosis thus is a disturbance of tissue metabolism, not calcium metabolism. Not enough matrix is laid down by osteoblasts (bone cells), but whatever is formed is calcified.

Osteomalacia on the other hand is a condition of adults characterized by softening of bones because of an accumulation of osteoid tissue, the bone matrix that fails to mineralize. The most common cause of osteomalacia is Vitamin D deficiency. Incomplete fractures may cause acute onset of localized pain and tenderness. Fractures are usually multiple and heal with an abundant callus (new bone) formation, consisting chiefly of osteoid, so that union is markedly delayed. It results in deformities, particularly of weight bearing structures, including the leg, the thigh and spine. Generalized bone pain and tenderness results.

Question 34 : Just a point: you have outlined the causes of osteoporosis and said that aluminium-containing antacids are one of the reasons. Do anti diarrhoea tablets also contain aluminium. If yes, is it worth mentioning.

Answer : Antidiarrhoeal drugs do not contain aluminum.

Question 35 : Is your patient Shashi Lamba a housewife or a professional? AT what age did she come to you for treatment. Is it her real name? If yes, then I will change it in my article.

Answer : Mrs. Shashi Lamba was of forty four years when she presented to us. She is a housewife. Shashi Lamba is her real name.

Question 36 : What is bone metastasis?

Answer : Metastasis means the development of secondary tumors at a distance from a primary site of cancer. In other words if a cancer spreads to other areas it is called metastasis. For example, a prostate cancer can metastasize to the bone.

Question 37 : Since male osteoporosis is very common in India, I want to add a box item in the article, giving it importance. Would you have an anecdote of a 40 year old or a guy in his late 40s [an age where Indian men can develop OS] who gets osteoporosis silently? A guy with no smoking/alcohol problem, and exercises regularly. Say, it could have started with a nagging pain and the doctors discover it is OS. The basic point is that we want to show that despite leading a so-called healthy lifestyle men need to address the problem of OS. They too should take calcium supplements. And not ignore signs of pain etc.

Answer : Antony was 52 years of age when he presented to us with fracture of the wrist after a trivial fall. A DEXA Scan revealed significant Osteoporosis. A detailed history revealed that Antony used to have a balanced diet and led a healthy, active lifestyle with adequate amount of exercises. However, he had been suffering from hyperthyroidism for the last fifteen years. Apart from treating his collar's (wrist) fracture in a cast, Antony was put on long-term calcium supplements and alendronate. He comes periodically for follow up and is doing fine.

Questions 38

- a. **How many Indians are afflicted with Osteoporosis? If we have the figure [an estimate, based on an Indian study, that is acceptable to all the doctors would also be ok,].**
- b. **Of these, how many women suffer from Osteoporosis and how many men?**
- c. **A rough estimate of how many Indian women, say over age 50 or 40, will have an Osteoporotic fracture.**

Answer

As far as I am aware there has been no proper epidemiological study on Osteoporosis in the Indian population. The only authenticated published literature that could be quoted is the book "Osteoporosis" by Dr. Balu Sankaran.

In his study the incidence of fracture of neck femur and Intertrochanteric fractures in two public hospitals (LNTP Hospital-499 cases from May 1998 to December 1999 & Safdarjung Hospital – 413 cases from December 1997 to December 1999) and one private hospital (St. Stephen's Hospital – 919 cases from December 1986 to December 1999) in Delhi was analysed. The percentage of fracture of neck of femur above 40 years was 52% in males and 48% in females. In the case of Intertrochanteric fractures above the age of 40, males accounted for 64.6% and females 35.4%.

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Question 39 : Do you agree that one of the main reasons for increased osteoporosis incidence is a couch-potato life-style. Which woman population in the work force is at more risk? Perhaps those leading sedentary life styles? Your comments would be welcome.

Answer : Among the predisposing fracture for osteoporosis are those which can be controlled like sedentary lifestyle, smoking, excessive drinking and low calcium intake. Other factors which are beyond control are – female sex, thin & small boned frame, a family history suggestive of osteoporosis, early menopause – either natural or surgical, estrogen deficiency associated with menstrual disorders, ethnic heritage (Whites and Asians are more at risk than Africans and Hispanics), advanced age, prolonged use of medications (excessive thyroid hormone, some antiseizure medications, glucocorticoids, excessive use of aluminium containing antacids, certain anticancer drugs etc) and growth hormone deficiency.

Sedentary life styles, low calcium intake and early menopause are amongst the most common predisposing factors amongst women other than advanced age. A gradually increasing life span has resulted in a bigger aged population, which also contributes to increased incidence.

An active life style with adequate exercises helps build and maintain strong bones. In addition in the aged, physical fitness reduces the risk of fracture since falls are less likely due to better balance, muscle strength and agility. Further activity boosts the appetite and hence adequate nutrition may result in their taking adequate calcium.

Question 40 : Doctor, would you have case history of a woman who has been taking bone-sapping medication say from her early 30s? The outline should be thus: She should be taking steroid drug – glucocortcoid – either for asthma/pulmonary disease since her early 30s. But by early 40s, she suffered multiple fractures of ribs/foot/thorax. Her bone density should be less that what it should be for a woman of her age. Her height reduced by 2-3 inches. Then her physician prescribes calcitonin, and gradually her condition improves. The conclusion: if the patient is prescribed cortisone-type drugs, they should go for regular bone density test to detect bone loss. So that she can be prescribed calcitonin or biophosphonate and supplements early on itself.

Answer : Mrs. Shashi Lamba presented to us with severe pain the back which was not responding to treatment by her physician. She had generalised tenderness over her dorsal and lumbar spine. In the dorsal spine the pain radiated forward to the chest as if a band was tied there. Any movement, cough or deep breath would increase her pain substantially. A detailed history revealed that she had a

Colle's fracture and a vertebral compression fracture in the past. Her posture had become somewhat stooped. The history further revealed that she has been on oral glucocorticoids for asthma since she was around twenty six years of age.

An X-ray revealed generalised osteoporosis in the dorsal and lumbar spine and three vertebral compression fractures. A Dexa scan revealed severe generalized osteoporosis. She responded very well to nasal spray of calcitonin, calcium supplementation and alendronate. The pain reduced significantly. The chest physician tapered the glucocorticoids and managed her with puffs. She is on long term alendronate and calcium supplementation.

Question 41 : The other anecdote concerns anorexia nervosa or poor nutrition:

The case should highlight a patient [between 18 and 25] having extreme eating disorders which can stop her monthly cycle, halting production of bone-protecting oestrogen. She comes for treatment of a fracture [could be her foot etc to your hospital]. Because she is young, her body is still capable of producing new bone. With proper diet, calcium and adequate exercise she reduces the risk of fracture and she is on the mend.

Answer : Geetika, a fourteen year girl came to us with severe pain in the right chest area and pain on deep breathing. An examination led to a suspicion of fracture of the rib. An X-ray confirmed this.

She looked very frail and thin almost as if she had come out of a concentration camp. A detailed evaluation revealed that she had developed a paralyzing fear of becoming fat and hence had restricted her calory intake drastically. Despite having lost almost twelve kilograms she still denied eating. She also used to exercise regularly and her driving force was a pursuit to thinness. She had also been under treatment of a gynaecologist since she had amenorrhea (a condition where the menstrual cycle stops) for the last eleven months. The history and evaluation revealed that she was suffering from a condition called Anorexia Nervosa. Because of the resulting hormonal imbalance she had amenorrhea and the estrogen deficiency had supposedly led to Osteoporosis. She required a very long period of counselling before she gradually came back to a balanced diet. Calcium supplementation had led to a gradual reduction in the pain in the chest. She has now come back to almost a normal life style.

Question 42 : How common is osteoporosis among men? Which age group gets afflicted the most? Would you have any data about osteoporosis in men from ISIC?

Answer : Osteoporosis classically has been thought to be more prevalent in women than in men. According to American statistics one in two women and one in four men older than 50 will suffer a vertebral fracture.

Though there are no large epidemiological studies, it is now believed that it may be more prevalent in the Indian men. Dr. Balu Sankaran's study as well as our experience at ISIC suggests that there may be a higher male to female ratio in the Indian population.

Since the incidence of femoral neck fractures in the Indian males is the highest in the age group 51-60 and that of Intertrochanteric fractures in the age group 61-70, it is presumed that Indian men get osteoporosis at a younger age compared to their Western counter-parts.

Question 43 : Do Indian doctors prescribe oestrogen therapy to cure osteoporosis in post menopausal women? Is it a proven fact that oestrogen reduces the risk of fractures?

Answer : Oestrogen therapy is widely used to manage osteoporosis in postmenopausal women in India. Oestrogen does reduce the risk of fractures. However recent studies have challenged the

assumption that HRT gives real long term benefits. The lack of prospective fracture reduction data for estrogen has resulted in the labeling of estrogens to be modified to state that they may be used to “manage” osteoporosis.

Hormone replacement therapy with estrogen, in combination with progestogen where indicated, is still the mainstay of treatment at many places for prevention of bone loss and fractures in postmenopausal women as well as reducing coronary heart disease and stroke. In non-hysterectomised women, progestogen is added for 12-14 days each month to regulate uterine bleeding and to protect against endometrial hyperplasia and carcinoma.

Question 44 : Who are the ideal candidates to receive oestrogen therapy?

Answer : Ideal candidates for hormone replacement and estrogen therapy would be women in the early menopausal period with significant hot flashes and other menopausal symptoms. It is contraindicated in women with previous history of venous thromboembolism or those who are at significantly increased risk.

Question 45 : What about the controversies plaguing the HRT – that it causes breast and uterine cancer? Is HRT on the wane now?

Answer : New guidelines developed in 2003 by the FDA advise doctors to consider alternative treatments to estrogen therapy. These changes were prompted by studies indicating that women who take estrogen or estrogen with progestin products after menopause are at higher risk for other conditions, including breast cancer and venous thromboembolic disease. Because of this, FDA suggests that estrogen – containing products should only be considered for women at significant risk of osteoporosis.

Question 46 : Does Raloxifene act like oestrogen n safeguarding bones and protecting the heart. But while oestrogen stimulates breast and uterine cell growth, heightening cancer risk, raloxifene doesn't appear to do so. Is this statement ok? Is it prescribed here by doctors on a large scale?

Answer : Raloxifene, a drug in a class known as selective estrogen receptor modulators, or SERMS, has been shown to protect against vertebral fractures in women with osteoporosis, produces small increases in bone mass of the spine, hip and total body, and reduces bone turnover in post menopausal women with or without osteoporosis. No significant effect has yet been demonstrated on non-vertebral fractures after 4 years of treatment. Raloxifene supposedly has the additional benefit of substantially reducing the risk of ER - positive invasive breast cancer and does not increase the risk of uterine disease. Raloxifene increases the risk of venous thromboembolic disease to the same degree as estrogen.

The multiple outcomes of Raloxifene Evaluation (MORE) trial was designed to investigate the efficacy of Raloxifene as vertebral fracture risk in 7,705 post menopausal women with osteoporosis. In addition to proving the efficacy on vertebral fractures risk it showed that postmenopausal women at high risk of heart disease have a reduced risk of stroke and other cerebrovascular events.

Among the women in the high risk subset, Raloxifene was associated with a 40% reduction in cardiovascular events compared with placebo. The risk of fatal and nonfatal stroke was reduced by 62% in the high-risk subset, and the risk of all cerebrovascular events, which included transient ischemic attacks as well as strokes, was reduced by 48% in the high-risk women randomized to Raloxifene. Raloxifene is now being increasingly used by doctors in India.

Question 47 : If one is past menopause, should she take raloxifene as prevention against osteoporosis? Does raloxifene lead to blood clots in the legs in some cases?

Answer : Raloxifene may not be taken by all women who are post menopausal. Raloxifene is probably most useful in women who have osteoporosis (T score less than or equal to 2.5) or who are at risk (T score less than -1.5 with clinical risk factors) in the middle menopausal period (age 55-65) or in the early menopausal period in women who have no significant hot flushes. At this stage in life, vertebral fractures are common, but hip fractures are not. Therefore, women who take raloxifene can expect a reduction in the likelihood of having a vertebral fracture, and possibly breast cancer. The lack of definitive efficacy against hip fracture is not a major deterrent to use of this agent in this age group because hip fracture risk is very low. Raloxifene might not be the treatment of choice for elderly women who are at particularly high risk of hip fracture.

Raloxifene does increase the risk of venous thromboembolic disease (blood clots in the veins of legs) and is thus contraindicated in women with previous history of venous thromboembolism or those who are at significantly increased risk

Question 48 : Who are the candidates [post menopausal or pre menopausal] who can take alendronate, and recently introduced Actonel {Aventis}, and Forteo [PTH] introduced last week in Bangalore by Eli Lilly. Today are bisphosphonates given to men as well?

Answer : In the mid-1990s, the FDA approved the first non-hormonal treatment for osteoporosis. Alendronate falls within a class of drugs called bisphosphonates. In clinical trials, Alendronate increased the bone mass as much as 8 percent and reduced fractures as much as 30 percent to 40 percent, depending on skeletal site.

To avoid damage to the esophagus, Alendronate should be taken according to the instructions. These instructions include taking the drug in the morning upon waking up and at least half an hour before eating. The drug should be taken with a glass of water, and the person should remain upright for half an hour after taking it. Alendronate should not be taken by people who cannot stand or sit upright or who have disorders that prevent esophageal emptying into the stomach. Risedronate, a more recently introduced bisphosphonate (marketed as Actonel by Aventis) is more potent and has fewer upper gastrointestinal side effects than Alendronate.

Alendronate and risedronate are approved for prevention of bone loss in recently menopausal women, for treatment of post menopausal osteoporosis, and for prevention (risedronate) and treatment (alendronate and risedronate) of glucocorticoid – induced osteoporosis. Alendronate is also approved for the treatment of osteoporosis in men.

Both alendronate and risedronate are now available as weekly tablets which has facilitated the patient compliance to treatment together with a decreased occurrence of gastro-intestinal side effects.

The use of intravenous bisphosphonates such as Zoledronate, Ibandronate and Pamidronate remains limited to special indications such as intolerance to oral formulations and treatment of patients with bone metastasis.

Since bisphosphonates have an effect on non-vertebral fractures as well, reduce the risk of fractures quickly (risk of clinical vertebral fractures is reduced after 1 year of treatment with risedronate) and have fewer and less serious side effects, they may be considered the first line of treatment for osteoporosis. However, it is to be specified that drug therapy alone is not sufficient and a healthy, active lifestyle with adequate exercises and calcium supplementation should be advised.

Forteo (teriparatide) is the first treatment that stimulates new bone growth to increase bone mass. All other drugs approved for osteoporosis treatment act by slowing the turnover of bone, rather than stimulating new bone formation.

Forteo is a portion of human parathyroid hormone, which works in the body to regulate the metabolism of calcium and phosphate in bones. The treatment is given in daily injections and is approved for postmenopausal women who are at high risk for bone fractures.

However, there is a strong caution to its use. In the pre-approval studies of Forteo using rats, there was an increase in the incidence of osteosarcoma, a rare but serious cancer of the bone. Because it's possible that women treated with Forteo could have increased risk for developing this cancer, doctors are advised to discuss this risk with their patients and be sure that it's the best treatment. Because individuals with growing bones (children and adolescents) and patients with Paget's disease of the bone have a higher risk for developing osteosarcoma, it should not be used in these groups. Furthermore, individuals with hypercalcemia, women who are pregnant or are nursing or those who have ever been diseased with bone cancer should not use this. Most other adverse effects are mild and include nausea, dizziness and leg cramps.

Forteo supposedly increases bone mineral density at most sites and decreases non-vertebral fractures more than alendronate.

It is also effective for treatment of men with primary or hypogonadal osteoporosis who are at high risk for fracture.

It should however be used in patients who have failed a treatment course with bisphosphonates (men) or with bisphosphonates and SERM (women) or are intolerant to side effects of bisphosphonates / SERMS. Since long term effectiveness and safety are not known, therapy for more than two years is not recommended.

Question 49 : Who is the candidate for calcitonin? Is Calcitonin a bisphosphonate or something else?

Answer : Calcitonin is not a bisphosphonate but a hormone that plays a role in calcium and bone metabolism. When used regularly it can slow the loss of bone. Calcitonin increases bone mineral density in early postmenopausal women and men with idiopathic osteoporosis. Calcitonin is also beneficial in reducing the bone pain associated with fractures. Available for many years as an injection, calcitonin treatment became much easier with availability of a nasal spray.

Question 50 : On what grounds it is claimed that milk (other than on mother) is perfect food. Is there a study available on the issue?

Answer : Milk is said to be the perfect food because it has all the essential nutrients required by human beings except for Vitamin C, Iodine and roughage (fibers). This is well established and plenty of studies are available.

Question 51 : How true it is that drinking 500 ml milk each day can save us from osteoporosis? and which countries have highest cases of osteoporosis?

Answer : Calcium is required by the body as per the under-mentioned table:

Age Group	Recommended Ca Intake
Birth - 6 months	210 mg
6 months- 1 year	270 mg
1-3 years	500 mg
4-8years	800 mg
9-18 years	1,300 mg
19-50 years	1,000 mg
51-70 years	1,200 mg
70 and older	1,200 mg

85 ml of milk has roughly 100mg of Calcium. Thus 500 ml of milk could meet the requirements of certain age groups but not in all of them. During specific periods of life like adolescence, pregnancy, post-menopause, there is additional requirement of calcium and hence supplementation of calcium is required in addition to taking adequate quantities of dietary calcium.

Countries that have the highest incidence of Osteoporosis are U.S.A, Australia, Switzerland, UK & Northern Europe and Italy. Osteoporosis affects an estimated 75 million people in Europe, USA and Japan. In the U.S. today, 10 million individuals already have osteoporosis and 18 million more have low bone mass, placing them at increased risk for this disease. Estimated national direct expenditures (hospitals and nursing homes) for osteoporosis and related fractures is \$14 billion each year.

As per International Osteoporosis Foundation, Indian and Chinese are especially at risk for osteoporosis, Indian men are equally if not more predisposed than women and Indian men and women tend to get osteoporosis at a younger age than their western counterparts. Expert groups put the number of osteoporosis patients at approximately 26 million in 2003 with the numbers projected to increase to 36 million by 2013.

Question 52 : What is so unique about the human being that they require milk even after the period of infancy?

Answer : 99 percent of the body calcium is found in the skeleton the remaining 1 percent is critical for a number of indispensable life processes.

Milk is one of the many sources of calcium. Many other types of food also provide calcium for the body. In addition calcium supplementation may be required during certain phases of life as mentioned above.

I am not sure if the statement "Calcium is required only in human beings after infancy" is a correct one. The animals may get their calcium from dietary sources other than milk.

Question 53 : Is it true that veg people are more vulnerable to osteoporosis than the non-veg?

Answer : It is wrong to state that vegetarians are more predisposed to osteoporosis than the non-vegetarians. There are ample and as good sources of protein and calcium in vegetarian food as in non-vegetarian food.

Question 54 : Is there any study being done over cases of lactose intolerance in India? (I found following links on the net -

1. <http://www.ajcn.org/cgi/content/abstract/34/5/943>

2. <http://www.google.co.in/search?hl=en&client=firefox-a&channel=s&rls=org.mozilla%3Aen-US%3Aofficial&hs=pO6&q=lactose+intolerance+india+study+by&btnG=Search&meta=cr%3DcountryIN> (plz go the link related to India today, which has ur reference ..)
plz let me know how valid are these studies ?

Answer :The above studies are authentic studies.

Question 55 : How much packet milk in Indian market might be fake and unhealthy?

Answer : There have been various reports of fake and unhealthy packed milk in the Indian market. I would not be aware as to what is the exact amount in this regard.

Question 56 : I am 52 years old and I am suffering from arthritis. My treatment is going on but still I suffer from extreme pain and feels stiffness early in the morning. Please tell me what to do?

Answer : If you continue to suffer from severe pain despite taking treatment, you should be evaluated once again in order to establish a definitive diagnosis and to ascertain as to why you have not responded to treatment. There are various types of arthritis.

Osteoarthritis is the condition in which the cartilage of joints undergoes degeneration. Various factors like ageing, genetics, weight and abnormal joint alignment play a role. There may be some secondary predisposing factors like previous injury and other types of osteoarthritis.

Rheumatoid arthritis is the most common type of inflammatory arthritis. Immune response is the body's natural defense mechanism. In inflammatory diseases this defense mechanism goes awry and attacks the body parts like joints. These patients present earlier (generally in the fourth decade) and often have multiple joint involvement. One of the characteristics feature is morning stiffness which gets relieved after some activity.

Psoriatic arthritis is another form of inflammatory arthritis that is often found in association with a skin disease called psoriasis.

Reactive arthritis comes after infections, like intestinal or genitourinary infections. It often affects young adults and responds to medical treatment.

Gout is due to the deposition of crystals of uric acid in the joint. It generally responds to medications, some diet modifications and lifestyle changes.

Pseudogout is due to deposition of other types of crystals (calcium pyrophosphate or hydroxyapatite). It may mimic other types of arthritis such as gout and rheumatoid arthritis.

Systemic lupus erythematosus is a systemic autoimmune disease which affects many internal organ systems. It most often affects women in the child-bearing years. Since this disorder is potentially life-threatening, early treatment is important.

Other forms of arthritis like ankylosing spondylitis, polymyalgia rheumatica, infective arthritis or arthritis associated with conditions like polymyositis, ulcerative colitis etc can be diagnosed by proper evaluation and investigations.

Once the doctor comes to diagnose the type of arthritis that you are suffering from, he/she would then evaluate if the treatment that you were taking was suitable for that type of arthritis. Suitable modifications in the treatment could be made accordingly.

Since you are only 52 years old and seem to have been suffering from arthritis for some time, you fall in the age group of people who could suffer from rheumatoid arthritis. The morning stiffness that you have also points strongly towards the diagnosis of rheumatoid arthritis. If the detailed evaluation and investigations confirm this, the doctor might refer you to a rheumatologist who may put you on disease modifying anti-rheumatic drugs (DMARDs) in addition to the anti-inflammatory drugs and / or analgesics that you might be taking. DMARDs help in reducing the damage to the joint by preventing the autoimmune activity. The doctor may also suggest other treatments including rest, ice/heat-packs, weight loss, exercises etc. If you do not respond to the DMARDs the doctor may suggest steroids injections into the joint. However if repeated injection also fail to give relief and you continue to suffer from severe pain which interferes with your lifestyle significantly the doctor may advise surgery.

Question 57 : What is the percentage of Indians afflicted with OA? And what is the age group?

Answer: True prevalence of the disease is very difficult to predict and calculate and the reason behind this is that pain in OA and disease pathology do not necessarily go hand in hand. We have one group that has symptomatic knee pain and only about half of them have radiographic OA. Then there is the population with radiographic OA and a large percentage of them have no symptom at all. Often people with severe structural disease have no symptoms.

The published work in Indian literature is scanty. The enormous published work on the subject of osteoarthritis of hip by European and American workers suggest that osteoarthritis of knee is less common than that of the hip, both in magnitude and severity. But, the Indian population is entirely different from Western world as regards to cultural, sociological and daily living habits, availability of medical facilities, people's attitude, nutritional status, living standards and ignorance about facts, so the etiopathogenesis may be entirely different as proposed in western literature. The general observation is that the incidence of degenerative changes in knee joint in our population is not only more but it also starts at an earlier age.

In India, there have been sporadic attempts at epidemiological studies of rheumatic and osteoarthritis disorders. The discipline has long suffered neglect in medical education in India. In a few scattered epidemiological studies that have been carried out, prevalence of Musculo-skeletal complaints is similar to that of Europe and U.S.A., when age is adjusted (Chandrashekhara 1990, Mitra 1993). A survey was conducted in Pune (1989-91) in a referral Centre by holding medical camps. It revealed a high incidence of osteoarthritis. The most affected joint in osteoarthritis is the knee followed by hip as revealed by several Indian studies (Mitra, 1993). More recently a population based survey conducted over a 3-year period (1989-92) in a suburb of Calcutta showed incidence of Rheumatoid arthritis as 1.04% among 19633 persons. Bhatt et al (1993) reported the results of a nation-wide survey of 19931 patients suffering from a variety of Musculoskeletal conditions. The distribution amongst these patients was rheumatoid arthritis 28.1%, osteoarthritis 24.8%, soft tissue rheumatism 12.4%, cervical spondylosis 26.7%, ankylosing Spondylosis 6% and Gout 2%. The Eastern zone of India had a lower proportion of osteoarthritis of knee. The male and female ratio in different conditions were rheumatoid arthritis 0.6:1, osteoarthritis 0.8:1, ankylosing spondylitis 3.1:1, Gout 2.4:1, cervical Spondylosis 1.1:1.

The age distribution of osteoarthritis showed preponderance of old patients, above 50 years being 60.2%. Some of the epidemiological features of osteoarthritis in India in a hospital based study,

were reported by Joshi et al (1989). The proportion of females was 56% which was higher than that of males (44%). The average age was 53 years and the mean weight 62 kg. 41% patients had 2 joints affected, while 20% had 3 or more joints involved. Prevalence of multiple (more than or equal to two) joint involvement was significantly higher in females (65% of females versus 56% of males). The number of joints affected increased with advancing age.

The pattern of joint involvement was as follows:

Knee (usually bilateral)	- 41%
Lumbar spine	- 16%
Cervical spine	- 11%
Hip	- 11%
Hands	- 11%
Shoulder	- 7%
Other	- 3%

Before age 45, osteoarthritis occurs more frequently in males, whereas after age 55 it develops more often in female.

The other point to note in arthritis is that the incidence is not going to decrease with time; rather it will increase in prevalence because of the demographics. We are getting older, more overweight and are getting increasing number of sporting injuries, which is a major risk factor for osteoarthritis.

Question 58 :Would you say there is an increased risk for those who walk long distances on rough ground regularly or carry heavy objects?

Answer :Certain occupation that require repeated stressful motions (such as squatting on kneeling with heavy lifting) can contribute to deterioration of cartilage. Hoagkond et al (1973) showed that squatting, sitting cross-legged and kneeling in prayer may subject the knee cartilage to greater and more damaging pressure. Workers whose jobs require kneeling or squatting for more than an hour a day are at high risk for knee osteoarthritis. Jobs that involve heavy lifting, climbing stairs or walking also pose some risk but it is not as high. To examine occupation related osteoarthritis in the general population, Anderson and Felson (1991) looked at occupational knee bending physical activity and concurrent knee osteoarthritis in a population based survey. Radiographic knee osteoarthritis rates were higher in men and women in balancing and service work professions whose job required knee bending more than those whose jobs required no knee bending. Being overweight compound the chances of OA.

Question 59 :How prevalent is it in India as compared to cancer and heart disease?

Answer :Despite the high prevalence and consistently high contribution of osteoarthritis on long-term disability, the impact of this disorder on the population is insufficiently appreciated in comparison to conditions such as heart disease and cancer which are associated with high mortality. No comparative studies could be found however.

Osteoarthritis has been incorrectly dismissed as a normal component of aging both by physician and patients. The moderate disabling potential of OA together with its slowly progressive nature may obscure the large overall population impact and does not lend the same sense of urgency as given to heart disease and cancer which are associated with higher mortality and disability rate.

**Question 60 :Would you say too much exercise or too little can cause OA?
%) Any Indian studies about women afflicted with OA?**

Answer :Dynamic loading at knee joint during walking or other routine activities of daily living is several times the loading caused by static standing position. There is now agreement that the principal etiology of degenerative arthropathy is mechanical and not inflammatory (Radin et al, 1981). There has been some question about the role of strenuous exercise in osteoarthritis. Sports that definitely pose a higher risk of osteoarthritis are those that require repetitive movement or direct joint impact (such as football), twisting or both (baseball, pitching, soccer). Marathon runners however have a relatively low rate of osteoarthritis. Running enhances cartilage health because the rhythmical compression of cartilage, expels waste and promotes absorption of nutrients. In any case regular and moderate exercises is very important for everyone and does not increase the risk of osteoarthritis. Further more, many factors associated with a sedentary life without exercises leads to muscle weakness, poor muscle tone and obesity which are associated with a high risk of osteoarthritis.

Question 61 :Would you say that sometimes having the right shoes would help? Do you know of any patient whose pain in the knees with OA has decreased by going to a podiatrist?

Answer :Using the right shoe does help in many patients. Heel wedges in the shoes can help patients to a certain extent by reducing the biomechanical load on the affected part.

Once OA has been diagnosed, patients should reduce shock to the affected joint. Hammering away at deteriorating cartilage is likely to speed up degeneration. People in occupations requiring repetitive and stressful movement should explore ways to reduce trauma by wearing shock-absorbing soles in shoes or Orthopaedic shoes. This can be of help in daily activities and during gentle exercises.

Question 61 : Do you know of a patient who has exercised a lot, or done much yoga and got OA. Age around 50. Someone who has had hip replacement therapy because the cartilage in the hip was worn away. I would need the patient's e-mail id/tele. no so I can talk to him or her.

Answer : I do not have a patient who fits the criteria mentioned. Even otherwise, our patients are at a higher age when they get replacements.

Question 62 : How expensive is this surgery? If it is expensive, is it a deterrent? Is the surgery available all over India?

Answer : Total knee replacement is specialised surgery which requires well-trained doctors and nurses as well as a proper-set-up including proper operation theatre, post-operative care, trained nurses and technicians and expert physiotherapist to achieve the desired results. There is a high variability in the cost. Most of the artificial knees are imported from US or Europe (cost of the knee varies from 60,000 to 80,000). There are 2-3 companies making joint replacement implants in India (cost of Indian knee is approx. Rs.30,000)

Nowadays this surgery is covered under most of the insurance policies and Central Government Health Services. So cost is not a major deterrent. At Indian Spinal Injuries Centre the average total cost in a semiprivate room is approx. Rs.1.30 lakhs including the artificial knee.

**Question 63 :The new treatment, viscosupplementation, whereby a gel-like substance is injected into the joint - how effective is it and what is the course of treatment? Does it work for all? How expensive is it? Would a cortisone shot be as effective?
Any research done in India on OA?**

Answer : Sodium hyaluronate (synvisc) is indicated only for the treatment of patients with OA of the knee. This treatment is an alternative to be considered in patients who do not respond to NSAID's therapy as who have a gastric ulcer disease. They are found to benefit men more than women and

they have no adverse effect on stomach. One study reported that between 39% to 56% of patients were atleast nearly free of weight bearing pain upto 24 weeks after final injection. Nevertheless a number of studies have shown no or little benefit with viscosupplementation, particularly in women. More work is needed to determine their usefulness.

These injections are also expensive. Intraarticular steroids are another option but should not be administered more than 3-4 times per year. No improvement in functional status has been reported.

Question 64 : Any research done in India on OA?

Answer : Research has been done in India to try and device an implant suitable to the Indian knee. The size of Indian joints has been found to be smaller than that of Europeans or Americans. Dr KH Sancheti from Pune and Dr Laud from Mumbai have done work in this regard.

Question 65 : I get pain while climbing stairs & walking. This pain is hindering my normal life style. What should I do?

Answer : If you get pain on bending your knees or climbing stairs and get cracking sound when you walk, you will need to be evaluated for the cause of the pain. If you are middle aged, the cause is likely to be an early stage of osteoarthritis. If you are more than 65 years of age, the pain is most likely due to established osteoarthritis. If you are young, it is most likely a muscular pain.

Osteoarthritis is primarily a disease in which the cartilage of the joints undergoes degradation. The predisposing factors are aging, genetics, weight (Osteoarthritis of the knee in particular) and abnormal joint alignment. The secondary predisposing factors are trauma, gout, rheumatoid arthritis and some other underlying joint and bone disorders. Symptoms of arthritis include pain (typically worsens with activity and changes in weather), inflammation, stiffness, restricted joint movement, deformity and disability. The goals of treatment are reduction of pain, improvement in joint and general function and overall improvement in health-related quality of life.

However if the pain is mild and not bothering you much, you could start with non-pharmacological management which includes muscle-strengthening exercises, hot fomentation / ice packs, heat application with gadgets like short wave diathermy, weight loss (if overweight), assistive devices for ambulation and knee support (like knee cap, crepe bandage). Any problem within the knee tends to weaken the quadriceps muscles, which support the knee. The weak muscles may in themselves cause the perpetuation of pain. Muscle strengthen exercises are thus very important component of the comprehensive management. In mild cases, muscle strengthening in itself may help in relieving the symptoms.

If the pain doesn't improve with the non-pharmacological management or if you have significant pain, you should definitely see a doctor and get your self evaluated. The doctor may then start pharmacologic management which includes anti-inflammatory or analgesic drugs orally or superficially to the joints. Anti-inflammatory drugs should not be used for a long duration since they can lead to significant morbidity and mortality due to harmful effects on the gastrointestinal system, heart and the kidneys. Drugs like glucosamine supposedly help in reducing the rate of degradation of the cartilage.

In patients who continue to have problems or in whom pharmacologic therapy cannot be tapered, injections of steroids or hyaluronan in the joint could be given.

Surgical treatment is reserved for those with severe symptoms who have failed to respond to medical therapy and have progressive limitation in activities of daily living. Surgery includes arthroscopy or high tibial osteotomy in less severe cases and total joint replacement in severe cases. Research in

the field of autologous chondrocyte transplantation and cartilage repair using mesenchymal stem cells is in an advanced stage.
