

### **Thoughts regarding Evidence Based Medicine**

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The terminology, "Evidence Based Medicine" (EBM) is modern, but is in fact how medicine should have been practised ever since it became a profession. Indeed, there is nothing new about the concept. Fashions come and go in all fields, and unfortunately not always related to suitable proof. Medicine is no different. Knowledge itself is the prime limiting factor. Theorems can only be implemented with the current knowledge base. Therefore what may appear to be correct today can indeed be wrong tomorrow. What separates man from other animals is the ability to think, learn from the experience and then improve from the knowledge gained. Thus a state of continual change is in place. Dogma more often than not is simply a statement on intelligence. Evidenced based medicine is no more than a changing knowledge base.

Opinion is seldom midline. Views vary widely, embracing the fanciful and pushing the limits of available knowledge to promote the latest trend. This can be likened to a pendulum. Rarely will the logic be found on the outer swing, the centre of the arc more likely to be the logical path. The current thrust in "Evidenced Based Medicine" has primarily arisen from institutional sources. While this in theory is fine, the current path is on the outward swing as it fails to take into account any psychological components of the crux item, the patient. It cannot. Science is a "cold" subject, and "absolute". Not so the human person. Essentially when viewing the overall evidence based approach to patients, we need to take into account a number of aspects. In this regard, musculoskeletal medicine (MSM) is no different to any other form of medicine.

The sequence can be set out as follows:

- A logical, detailed and inquiring history.
- Physical examination that is pertinent to the patient history, an algorithm if you like, (the current "in" word).
- To complete the above you require tests that are relevant and accurate. This presents a problem in MSM.
- A precise diagnosis. One cannot treat what one cannot diagnose.
- Treatment that is derived from the above collection of information.
- An outcome that does improve or heals the patient.

## **EBM**

Evidence Based Medicine is the latest trend and unfortunately many colleagues use EBM in the wrong manner. Statistical results are a key issue in EBM and are frequently used as a proof for the presence or absence of a positive effect of a therapy. Therefore statistical results become a measurement for the reality. Some use, or worse, misuse statistical results as "the truth". In this way statistical procedures and results can become a kind of "law". Qualified statisticians teach that statistics are always an approximation of the reality and never reflect the whole reality. This means as long as the precise aetiology of a disease is unknown, the extrinsic and intrinsic factors influencing the individual course or clinical expression of the disease is, by definition, heterogeneous. As a consequence the study conditions never reflect the reality. Thus many individual patient factors influencing a therapeutic result remain unknown. Also, in statistics we have used the randomised clinical trial (RCT) as the ultimate gold standard for about 50 years. This implies we have very limited statistical tools for evaluating therapy in medicine. Perhaps it is time for statisticians to develop better statistical tools.

EBM is a trend and will probably be replaced by a new trend in the future. To misuse EBM as the absolute truth is a negative trend. EBM has a positive role when it stimulates us to think critically about our daily diagnostic and therapeutic procedures.

Many diagnostic procedures and therapies are kept alive in medicine because at university they were taught as the truth. To question these procedures can make the medical practitioner feel insecure. Perhaps equally importantly the questioning threatens their financial position. For example, it has never been proven that lumbar surgery in low back pain is beneficial. Suppose that the orthopaedic surgeons - based on EBM - were not funded for such types of surgery on the rebate system. How many would find themselves in financial difficulty?

The above is also true for musculoskeletal medicine. Many diagnostic procedures are in question. This means, by definition, they should not be taught to students. We need the diagnostic experience of the MSM practitioners for they can provide the scientists and statisticians with the diagnostic problems for further scientific studies. In turn the scientists and statisticians can provide the MSM practitioner with feedback information about the validity of the diagnostic procedure that in turn can upgrade the current diagnostic method or evolve new ones.

The advantage of valid diagnostic methods in MSM is that it helps us to define clinical syndromes. Different syndromes, such as primary lumbar disc involvement or trochanteric bursitis may show an overlap of the positive results in the same valid diagnostic tests. However, their results in certain additional tests, can differ. A pattern of positive and negative tests can differentiate between clinical syndromes.

This is the theory of Evidenced Based patient management. Obviously, complete implementation of an evidenced based approach is not possible. Current tests are simply not sufficiently accurate. Single conditions usually do not exist and there are a number of syndromes in MSM that defy precise definition. A patient responds differently to treatment procedures and there is (and always will be), a psychological component in human treatment. This is not to deny that a logical and scientific approach should be taken, only that human factors also need consideration. This is the objection that the practising doctor can level at the academic who may be out of contact with the human element. This situation can push the path of logic to the widest arc of the pendulum swing.

Taking the above points one at a time we can enlarge upon the overview.

## **History**

Shortcuts inevitably lead to missed information that in turn can produce a false diagnosis. Within the medical field the "red flag" situation is always present. The history should therefore be a full, but concise one and the practitioner must have the basic knowledge to exclude "red flag" conditions that may lurk in the background. The lack of knowledge in this field is clearly obvious with fringe practitioners such as chiropractors. Without formal medical training these people are ill equipped to deal directly and safely with patients with medical problems. If you do not study medicine then you cannot practise medicine. MSM problems have logical, step-by-step formulations or pathways set out to enquire into the conditions. A sequential set of questions can be arranged so that at any point one can move in another direction to question further about a symptom that suggests other involvement, for example, radicular pain. This then establishes an "evidenced based" approach to history taking.

The "evidenced based" approach decrees that a sequential history be taken. Essentially this is only moving logically from one point to the next. There is absolutely nothing new in this and in fact all histories should be taken in this manner. Protocols must be set in place and defined before we can teach them to others. When a patient's answer to a standard medical history deviates from normal, it suggests the existence of a "red flag" problem. Combining data from a medical history and with patterns of positive valid diagnostic tests improves the validity and specificity of the whole diagnostic procedure. Therefore there must also be validity studies for medical history items.

In training MSM physicians to Diploma standard or beyond, there should be a logical base approach taught for history taking. It is probably the role of the FIMM Scientific Committee to develop these standards and the FIMM Education Committee to implement them in teaching programs. A uniform world standard requires a world-wide organisation to implement them. Single nations embarking on this path will only compound the existing problem of diversity.

### **Examination**

The examination should be a logical step-by-step procedure. There is no point in undertaking a full neurological examination if the patient presents, for example, with low back pain and no lower limb neurological symptoms.

In MSM there are very few accurate tests and to gather the information/evidence required for a diagnosis, a number of tests may be required. It is totally inaccurate to claim all MSM tests are useless. Current knowledge has to be used and we should aim to develop better physical examination techniques. In the meantime it is folly to discard the tests we have.

We consider it insane not to examine a patient. As far as the spine is concerned, all trained MSM physicians should be able to at least locate the segment involved. It becomes academic nonsense to try to differentiate whether the pain is being generated from, for example, a small facet joint effusion or some trapping of the synovial membrane. The attempted standards proposed for MSM should be directed at improving our current knowledge. All other branches in medicine have similar problems. For example, many a normal appendix has been surgically removed. Training of MSM physicians has to be directed towards a uniform world standard that enables the above to be achieved.

The algorithm for examination should have been taught already at medical school, but unfortunately, due to varying national standards, it may be lacking in quality and uniformity. There should be a universal acceptable standard available for teaching. Once a protocol has been formulated a precise algorithm can be set out on paper. This then forms the basis for teaching the correct examination procedure.

## Examination Tests

Conclusions about clinical tests can be drawn only after validity studies of the tests are undertaken. Negative results of a particular test or combination of tests does not automatically mean that these tests are useless. It must stimulate us to ask questions such as "why does this test work in my daily practice" and "were my assumptions with respect to the diagnostic goals of the test right?" This can lead to further validity studies.

The clinical accuracy of current physical examination tests is of concern. While not perfect, but using a sufficient number of tests, one can locate the source of trouble quite well to regions. It is fair to point out that many structures are involved in any pathological lesion. When a bone is broken perhaps the greatest pain generation comes from the muscle spasm around the fracture site. In MSM a number of structures are involved. For example, in a zygapophysial joint subluxation, there will be bone displacement, joint effusion, capsule stretching, increased muscle tone, and chemical nociception. If the role of the academic is to say we must be precise and name the "single" cause for an accurate diagnosis, then perhaps academics should reconsider in the light of EBM.

This now introduces the concept of syndromes. There is a need to clearly understand the difference between a "lesion" and a "syndrome." Perhaps in the naming of lesions, such as lateral epicondylitis, there should be a broader or more general term. For example, a term like "lateral elbow fibromuscular impairment" Here you are not labelling a single entity as the pain generator. On an EBM basis it is impossible to do so. As with a spinal facet joint, there are a number of tissues that can be involved.

Clearly there needs to be a lot of research into improving tests or inventing new, more precise tests. In the meantime one can use current physical examination tests and accurately locate a region. It is reasonable to state, "If you cannot diagnose then you cannot treat." There is a distinct difference between an educated MSM physician concluding that there is, for example, a "red flag" condition at the L5 segment in the spine and a chiropractor manipulating the same segment because there is pain there. The history gives you the most clues, but examination plays an important role. Examination testing of the patient is not only physical examination, but it also includes other investigatory procedures. This enlarges the overview of diagnosis and proposes algorithms for physical based tests, radiological investigations and pathology tests. In drawing up guidelines we may need to consider all of the above.

## **Diagnosis**

The naming of a condition or syndrome requires a considerable amount of time. In the words of Robert Ward, Professor of Osteopathy, Michigan, "are we treating the same condition?" Perhaps we can reply to this by asking, "are we using different names for the same conditions?"

For conformity in teaching, passing examinations, forming colleges and in attempting to unify MSM as a single medical speciality, we must have a common denominator to investigate, diagnose, define and treat. While gross variations exist it becomes impossible to have an internationally accepted standard. In so doing, it must proceed with logic. To tear up all current diagnosis is just another example of the swinging pendulum.

## **Treatment**

It is becoming popular to state that the current literature does not show efficacy in treatment in many cases. Perhaps this is so, or perhaps certain groups select the trials that prove their point. Or maybe, the trials that have been undertaken lack planning, depth or clinically orientated direction. We do not know these answers. We do know that we have heard a lot about the failure of specific techniques in certain treatment methods, but feel amazed at the number of patients who recover with these methods that "do not work." Science pretends to be absolute. In the formulation of evidence based procedures such rigidities are usually implemented. Unfortunately the human being is a combination of psyche and soma, and science has not yet learned how to deal with or even explain, much less understand the former. While these two factors are involved, the very scientific basis of evidence based medicine is not sufficient to treat the human being. A patient is not a machine and, to complicate matters further, all patients vary. The absolute rigidity of science itself seems lacking when confronted with the human patient.

## **Randomised controlled trials**

Most published studies concern the evaluation of a single form of therapy, eg, manipulation. However frequently in MSM, management is multimodal. Two aspects need consideration in decisions about evaluation of a therapy or therapies in RCTs. First, certain therapies are indicated for specific syndromes. Hence, the therapy chosen for study should appropriate for the syndrome under study. Second, when the study population has a number of different syndromes, the therapies should be appropriately matched to the syndromes. Where a combination of therapies is selected (for instance therapies A and B), there always must be a homogeneous study population. This population is divided

into three different therapy groups (therapy A, therapy B, therapy A+B). Only in this way can the hypothesis of combination therapy be proven to be the most effective one.

### **Outcome**

Scientific, or non scientific, the only outcome that matters is, "Did the patient get better?" It would be convenient if science could provide the perfect algorithm for recovery. Although it is unlikely to do so, we should never cease the search for more efficient ways. Evolution over the past centuries has always carried us forwards. This pattern will continue and will undoubtedly accelerate. All advances in the broad spectrum of medicine should be embraced. If doing so, this does not mean we should drop all current treatment modes because an isolated trial throws doubt on them. Perhaps more rigorous trials should be embraced.

Treatment techniques and methods (drug, surgical, or manual) are an essential part in training MSM doctors. They must be included in any book of MSM. We may need to pay more attention in recommending methods of therapy, but until others come along we will need to rely on the ones at hand. It is also worth considering that two patients with the same diagnosis may require treatment in different modes. This is not so unusual when you stop to think that two asthmatics may require different drugs, or two surgical patients may need different incisions for the same condition. Again this illustrates the danger of forsaking general medical methods for a new "evidence based treatment" that may not work. If one takes science's own definitions, the "evidence based method" must work 100% of the time to be scientific. You must make your own conclusion on this.

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