
Prevention of Neurotraumas and Road Safety

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Before beginning my lecture, I should give my sincerest thanks to the Multidisciplinary Euroacademy of Neurotraumatology for the kind invitation to participate in this Fourth Congress.

1. ROAD SAFETY, AN URGENT PROBLEM

The mere reading of the title of my lecture to this Plenary Session indicates that there are two matters to be dealt with here. These two matters are so inseparably linked that even at the risk of interrupting the logical flow of my talk, I feel that I should address them as a single subject.

When Karl Benz patented the first automobile just over a century ago, he could not have envisaged that its use on a massive scale, and not always in a responsible fashion, would make it one of the most important causes of death and of all sorts of damage in developed societies, and even in developing countries. Let's look at a few statistics which despite being of anecdotal value, give us some idea of the seriousness of the problem of road accidents.

- There are more than 40,000 deaths a year in the European Union.
- Almost half a million in the world as a whole.
- If we added together the deaths in road accidents in Europe over the past 25 years,

the population of a city roughly the size of Brussels would disappear.

- If the calculation referred to serious injuries, we would have to imagine a city the size of London being converted into a gigantic hospital.
- In the USA, they say that in this same period, more American citizens have died in road accidents than in the four wars in which America has been involved in the twentieth century (the two world wars, Korea and Vietnam).
- As far as head injuries (the main topic to be studied at the Fourth Congress of the EMN) are concerned, the data varies a little depending on the sources consulted. However, it can be stated that at least 55% of all head injuries are due to road accidents and some would put this figure as high as 75%. All the research agrees on the fact that head injuries caused by road accidents are normally very serious.

There are, therefore, a wide selection of statistics that corroborate our initial statement: that this is one of the most serious problems affecting the modern world. It is probably pointless or vain on my part to continue insisting on the importance of road safety, because it is clear that the body I am addressing today is made up of a select professional group who are at the sharp end of the consequences of this reality everyday.

However, and this never ceases to surprise me, this harsh reality is normally accepted with notable calmness and coldness, perhaps because news about road accidents has become such an everyday event that neither public opinion nor public authorities are affected by it.

Considering the magnitude of the problem and the normally impassive response to it, it is clear that an urgent reaction is required, and although it is also clear that the main responsibility lies with the government, with public bodies, it is really a task that concerns all of us. I would not like to fall into the temptation of paraphrasing Clemenceau, French Prime Minister during the First World War, when he said that war was far too serious a business to leave it in the hands of soldiers; I would say however that this statement is much more than a personal obsession, and that road safety is something too serious to leave responsibility for it only in the hands of Governments and other public bodies. It is society as a whole that should take action to prevent accidents and their consequences and, in short, work for road safety.

2. SOME CONCEPTUAL AND METHODOLOGICAL APPROACHES

As an introduction to a first outline of the problem, it is worth remembering the three factors involved in driving, which may logically be the cause of accidents. It will therefore be possible to take preventative action in relation to these three factors:

The road and its surroundings

The vehicle

The human factor

All three factors are important, but seen from the point of view of their respective ranking as causes of accidents, the human factor is the most important. Indeed, from the most accurate research carried out in different countries and at different times it can be seen that:

- The human factor is involved in 90 to 92% of all accidents.
- The road was a factor in 18 to 22% of the cases.
- The vehicle was a factor in 10 to 12% of the cases.

Obviously the three factors are cumulative and interactive as far as their potential for causing accidents is concerned.

The dominance of the human factor does not mean that preventative or corrective measures should focus exclusively on it, and not only because the road and the vehicle also share their part of the blame as accident factors. We should also bear in mind that on more than one occasion human errors can be avoided by modifications in infrastructure or improvements to vehicle safety systems.

But what are we referring to when we talk about road safety? The answer is complicated because road safety is not a single, closed concept. Indeed, road safety is more an aspiration than a reality. With this in mind, road safety is normally viewed on four levels which depend on the measures involved in:

LEVEL ONE. Preventing accidents. This is probably the field with the greatest variety of measures, because on the one hand the three factors (road, vehicle and human) are involved and on the other they are focused particularly on the human factor with measures such as road safety classes in schools, training of drivers and campaigns in the mass media, as well as different types of punitive measures implemented by the police. The measures affecting the roads are also varied, as they may include the design, construction, signposting and maintenance of the roads. Finally as far as the vehicle is concerned, measures include the introduction of active safety systems (to use a widely-used term) such as the improvement in steering, braking and suspension systems etc...

LEVEL TWO. Limit the consequences of accidents in the moment they occur. Here we come to the so-called passive safety systems (helmet, seat-belt, airbag etc.) as well as certain safety devices on the sides of roads and of course (as always placing particular emphasis on the human factor) accurate information as to how to use all this equipment correctly.

LEVEL THREE. Prevent the consequences of the accidents from becoming worse by means of effective mechanical and medical aid. We should include in this section the implementation of the emergency services and the creation of an effective system of information and of a network where the required assistance can be obtained. Once again, the measures relating to the human factor will be centered on how best to act to provide help, clearly specifying what must be done, and, what is sometimes more important, what should not be done.

LEVEL FOUR. Repair the damage caused by accidents and help to reintegrate injured people into society. We include all types of compensation, repair or recovery from injury both in material and personal terms.

As you can see, these four safety levels do not coincide exactly with the general prevention levels accepted by medical science, as there are only three of these, but when talking about road safety, I prefer to distinguish between the palliative measures taken at the moment the accident occurs and those taken later.

Such a complex problem requires by necessity complex solutions and so institutions, normally governmental ones, which bear the ultimate responsibility, have gradually defined their criteria for action, following the course set by the most advanced countries in motorization such as the USA, France, the United Kingdom, Japan, Germany etc. in the mid 1960's when the first road safety plans were introduced. In order to establish a structure, which was later continued and reproduced in almost all developed countries, the programmes of measures to be

taken were systematised with the formulation of what we can now call "classic" traffic handbooks at the end of the 1950's, which gathered together road safety measures under the headings of the classic three "E's":

- "EDUCATION", in its widest possible sense.
- "ENGINEERING" or technical measures.
- "ENFORCEMENT"

About ten years ago, a fourth "E" was added, "EMERGENCY", which referred to emergency services.

This is the classic structure of public road safety plans and it is the model that has most generally been followed, among other reasons because it was later upheld by the OECD in a research project which was correctly titled "Integrated road safety plans". This may serve as a valid model for plans produced by private initiative, although some areas are quite hard to enter, particularly "enforcement", an area in which the responsibility of public authorities is so dominant, that the private sector's only possible role is to co-operate in the dissemination or explanation of specific regulations.

In any case, we should take this structure simply as a frame of reference; the MAPFRE Road Safety Institute, as I will later explain, has opted for an open, multi-disciplinary formulation. However, any organization that decides to get involved in the struggle in favour of road safety should feel absolutely free to work in the field or fields to which it feels best suited.

3. IT IS ESSENTIAL FOR SOCIETY TO GET INVOLVED

Starting from our initial ideas as to how to achieve better road safety in a general sense, and starting as I said before, from the need for all of society to participate, we should con-

sider what role each person or organisation is prepared to play.

A working committee on road safety was set up in the Spanish Senate in 1990. After a year and a half's work it produced a report which was passed unanimously by the Senate. We would like to point out that after analysing the situation in Spain, the report called on all Public bodies and employers and workers' representatives to sign a "Social Pact for Road Safety" in order to show the commitment of the whole of society to the struggle against road accidents. This pact was to be the embryo of a strategic plan in which the political and moral commitments of the pact were applied (using specific plans of action).

The social pact was signed in the Senate in April 1994 by 100 public and private organisations, and the strategic plan was passed by the government a few months later. The pact and the plan contained two basic ideas:

- Reorganise the priorities of action of all signatories to put road safety in the first few places.
- Stop any activity which although it may promote other legitimate interests, may be contrary to the interests of road safety

Five years after the signing of the social Pact, I ask myself without finding any possible answer, how many organisations have actually taken action consistent with these two commitments.

Things are not much more hopeful at the European Union level, because when the possibility arose of creating a common road safety policy, one which was real and not purely rhetorical, there were three very active member states, a majority that supported it with greater or lesser enthusiasm and a minority (of sufficient size to block the initiatives) which was radically opposed to this idea of creating a common road safety policy.

As far as the business world is concerned it is also difficult to find a response to the call for what I normally refer to as the great social movement in favour of road safety. I admit that this may seem to be an overly pessimistic view of this matter, but it is not uncommon even for the insurance sector, which is undoubtedly the most directly concerned in any improvement in road safety, to claim that the task of prevention falls exclusively on the shoulders of government. In this way they take for granted that their own responsibility in the world of traffic circulation and more exactly in the road safety field is sufficiently well-covered by the fulfillment of their obligations as insurers, namely repairing and compensating for the economic consequences of accidents. In truth, this statement is not wholly untrue, at least as far as the strict fulfillment of their contractual obligations is concerned, but as I said before, and will later go on to repeat, our aim should be to advance a little more in assuming "unwritten" social responsibilities. Let us consider other business sectors, for example car manufacturers. They normally claim that their only mission in the world of road safety is to make safer cars. This may also be true, but as in the case of insurance companies, they are limiting themselves to carrying out their duty. All of them, as well as driving schools, the mass media, educational institutions at all levels, the scientific community (especially the medical community) and any social sector that touches, albeit tangentially, the world of traffic circulation should contribute to promoting road safety by doing more than just carrying out their specific jobs.

4. HOW TO ACT

From the perspective of road accidents, the prevention of head injuries should be viewed within the framework of the four levels of road safety to which we referred before:

- Level one: It is obvious that to prevent head injuries, all measures should be focused on the prevention of accidents in general, as it is impossible to focus on the prevention of one type or accident or another. Logically this is not acceptable either ethically or practically.
- Level two: certain specific actions are possible in this field. Suitable passive safety equipment must be available (especially seat-belts and helmets) as well as accurate information about how to use it.
- Level three: The promotion of medical assistance "in situ", a correct evacuation and transfer, always to a suitable hospital is the best possible form of action. But let us not forget the importance of a good, clear information campaign on first aid which explains to the average citizen what he should do in each case, and what is more important, what he should not do.
- Level four: Here the responsibility is shared closely between the medical world (neurosurgeons, accident specialists, physiotherapists, psychologists etc.) and the insurer, without forgetting that the latter is especially concerned, from a purely economic point of view, that the after-effects of the neurotrauma are as slight as possible. And bearing in mind of course, the decisive importance of the accident victim's family. The promotion of associations of victims' families is certainly an excellent contribution.

5. MAPFRE'S EXPERIENCE:

In June 1996, it was decided to create the *Instituto Mapfre de Seguridad Vial* (Mapfre Road Safety Institute) as an integral part of the *Fundación Mapfre* (Mapfre Foundation). As it is a part of

the *Fundación Mapfre*, it is of a totally altruistic and philanthropic nature and completely separate from the commercial interests of the companies of *Sistema Mapfre*.

However, this is not the only possible model, as it is perfectly proper for the road safety activities to be profitable in a business sense; in fact it is not uncommon for different companies to carry out occasional road safety actions in the context of publicity campaigns. In my opinion, actions such as when a car company publicises the safety systems of one of its models, should not be considered as preventative actions. Of course it is preferable to use safety rather than speed as a selling point ; but we are talking about taking a step forward, and this would be, continuing with the same example, if a car manufacturer recommended drivers not to drink alcohol when they are going to drive, even if this recommendation was connected to the use of the model referred to in the advertisement.

I think it would be useful to make this idea very clear as the important thing is to take action. It is probably easier to reach the public with a safety message which is not linked to another commercial message but this does not reduce its effectiveness. All of this without taking into account that some actions , such as for example a campaign on technical servicing of vehicles are totally compatible with a commercial action.

The models of action are therefore very diverse and they are probably all perfectly valid; so it must be up to each company to decide which of these possible courses of action suits their general strategy best, without any limits apart from those dictated by common sense.

For similar reasons, it is neither easy nor probably desirable, to establish a rigid catalogue of recommendations as to the actions to be taken because to act with a minimum degree of effectiveness, it is necessary to know about the real road safety situation and about actions which have already been taken. This brings us firstly to

the necessity of having accurate information about the road safety situation within the area or time period within which we wish to act. Normally, this information can only be provided by the State, unless information reached by analysing our own clients portfolio could be considered representative enough; in any case, the rapprochement to the State required could seem a contradiction because road safety actions coming from the private sector could be taken with a certain degree of independence from the Civil Service. However, it will be essential to maintain a reasonable level of co-ordination with the State, or at least a good mutual understanding, even if this is only to avoid repetitions or contradictions. In any case, this aspect of the relations with the State is one which does not allow for absolute, 100% correct generalisations as to the most convenient model. Recognising the need for co-ordination which always seems to be advisable, there is no fixed rule to guide these relations; the same model in the same country may even differ from one action to another. In any case, in our course of action we should not reject, at least "a priori", the possibility of becoming a sort of critical conscience of public sector action, when circumstances advise this, in particular to encourage the State in the wide range of responsibilities that it has in the road safety field. Because we should not forget that different public bodies are involved in road safety; as a minimum (we should encourage) those responsible for :

- The control and regulation of traffic.
- Road construction and maintenance.
- The safety of vehicles, including industrial policy.
- Education.
- Health.

It will probably be necessary to encourage more than one of these, as not all of them see road safety as a problem that concerns them immediately or urgently (this occurs in all countries); on the contrary, it is relatively frequent for them to have a tendency to divert this problem to the body responsible for traffic control. Once again in this aspect, a call for good sense is essential. But let's go back to the **experience of the Instituto Mapfre** in road safety. 1999 is the second year it is functioning at full capacity. For this financial year it has a budget of over 4 million dollars and carries out its activities in accordance with the following guidelines:

- **Major boost to the education of children:**

The Mapfre Institute has Road Training Centre which includes a traffic park for children. We are also continuously carrying out road safety activities aimed at schools throughout Spain, including the creation and distribution of extra teaching materials.

- **Dissemination and information campaigns:**

This includes both occasional actions devoted to a single subject (alcohol and young people at the weekend, driving calmly in the city, moped safety) and also general permanent actions on the most important radio stations.

- **Scientific and technical investigation in collaboration with different universities and similar centres:**

At this time we have very varied research projects in operation. These are in very diverse fields such as advanced simulation of driving, or the design of re-education systems for people convicted of driving under the influence of alcohol, to give just two examples.

- **Actions on specific stretches of road** (in agreement with the Civil Service authorities), in accordance with the following requirements:

- They must be considered “low-cost actions”, according to civil engineering terms.
- “Technological transfer” must be possible. They can not be unusual problems nor solutions, but reasonably applicable.

This does not mean acting as a replacement for the state in *straightening dangerous points*, but experimenting with solutions. If these solutions turnout to be adequate, we would suggest that the state apply them.

- **Technical servicing of vehicles:** The Institute has mobile and fixed diagnosis units which can service 80.000 vehicles per year.

- **Publications.**

- **Symposiums:** On many different aspects of road safety.

All of this broad and ambitious programme, the growth of which is envisaged in the coming years, is only possible in the context of a group of companies whose sensitivity towards road safety is long-standing and well-established and whose vocation to serve society is one of its main distinguishing features.

This is our working plan and experience with pleasure and in hope for a safer future, we put at the disposal of the Multidisciplinary Academy of Neurotraumatology.

Thank you very much for your attention.

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