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HEAT, STRESS, MANAGEMENT AND HEALTH

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BACKGROUND AND ORGANISATION

Measurements of heat stress on employees in smelters showed raised blood pressure (hyper tension) during heat exposure. A previous international publication [1] concluded that prolonged heat exposure can lead to permanent hyper tension and increased risk for cardiovascular diseases.

It was decided to look into this by following two groups of workers at one Norwegian smelter. One was exposed to heat, and the other a control group. More than 200 employees took part in the two groups in the study. Blood pressures and other relevant health parameters were measured regularly for ten years.

Professor Jan Eriksen, The Central Hospital of Akershus, has been scientifically responsible for the study. Manager of occupational health in Elkem, Thorstein Guthe, MD, initiated and designed the study. The measurements have been done by the plant health service.

Based on the results it was decided to do a survey on the stress experienced by the employees during two restructuring processes taking place at the smelter during this study. This was done by students from Agder District University.

The employees answered a questionnaire regarding their experiences during the restructuring processes in the company. We also checked for changes in life style relevant to the survey.

RESULTS HEAT EXPOSURE

As can be seen in Figure 1, the group exposed to heat and the control group showed identical development of blood pressures during the study. The initial difference is explained by the fact that the group exposed to heat was more overweight and had less physical fitness.

The difference between blood pressure at the start and the end of the study is a normal increase in a populations 10 years older. If the results are split on different age groups, they show no differences in blood pressure development.

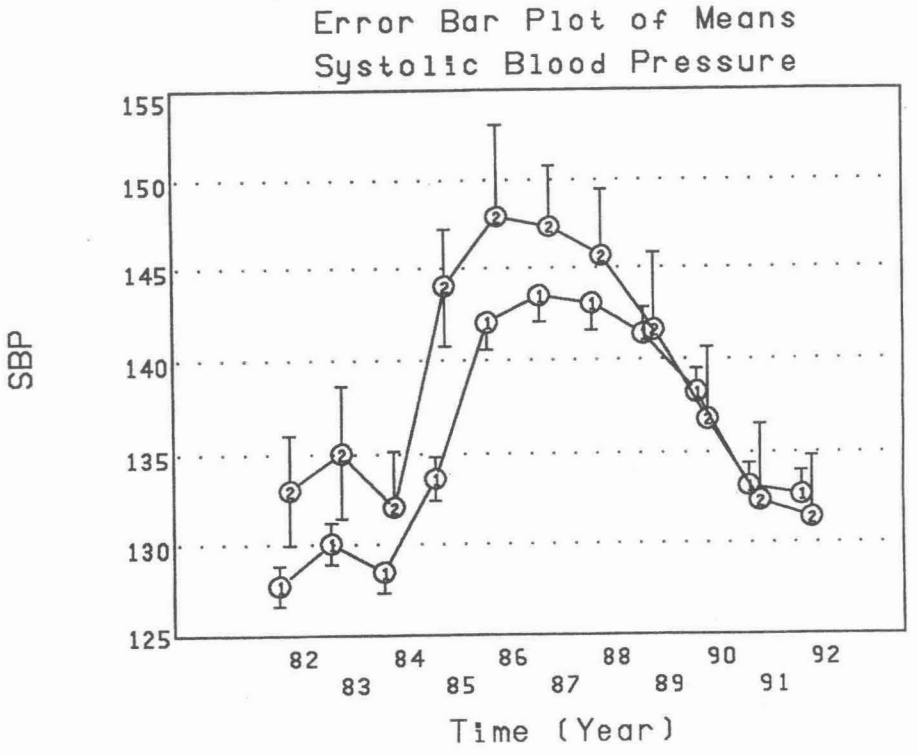

Figure 1. Development in blood pressure in the control group (1) and the employees exposed to heat (2).

RESULTS STRESS

In 1985-86 a major hyper tension developed both for the heat exposed and the control group. This occurred at the same time as the company went through an economic crisis and a following reorganisation.

The plant was split into separate accounting units, which uncovered that the smelter was unprofitable. The staff reduction at the smelter was dramatic: More than one fourth took early retirement or were fired.

The other health parameters clearly indicated that the hyper tension was caused by stress. If it proved to be permanent, a doubled frequency of cardiovascular diseases could be expected. In the average Norwegian population this causes one third of the mortality. Thus the consequences could be dramatic.

After 3-4 years OF hyper tension, the blood pressures started falling in 1989. In 1990-91, the company went into another economical crisis as severe as the first one. As seen from Figure 1, this time no effect could be seen in the blood pressures.

THE RESTRUCTURING PROCESSES

The striking difference in the development of the blood pressures during those two crises lead to the simple question: Why?

The survey on stress experienced among the employees showed that no single factor gave an answer alone. However, every difference proved to be in favour of the second restructuring process:

Table 1: Differences between 1985/86 and 1990/91

Topic	1985-86	1990/91
Furnace exploded 1985	Strong feeling after 9 years!	
Restructuring process	First serious crisis	Immunisation and learning
	Run from outside. Plant management was changed	Local control and strategy
	Rumours flourishing	Increased production
Staff reduction	Major, > 25% lay-offs	Small, < 10%
Job satisfaction	Negative	Neutral
Social relations	Neutral	Improved
Work Interest	Neutral	Improved
Attitude to company	Negative	Positive
Information	Too little	Better
Management's handling	Negative	Neutral
Participation in process	Low	Higher

Comments to the findings:

* A furnace exploded in the summer of 1985. Although there were no casualties, many were shaken. Most remembered the explosion clearly after 9 years, some releasing strong feelings. This increased the feeling of stress during the following crisis.

* The 1985 plant restructuring was the first serious crisis in modern times. It was handled in a classic way: Two persons came down from headquarters and called everyone to a meeting. The plant management was fired, and new people given the task of running the restructuring process. Staff reductions by more than 1/4 were announced.

* The process was run from outside. The employees received insufficient information, this lead to flourishing rumours and developed feelings of insecurity.

* In 1990, a company development program had been initiated. There was both a strategy and a plan of action, and the process could be run locally. Representatives of the employees participated actively, which also improved information.

* To have experienced one crisis leads to learning and providing confidence that also the challenge in 1990/91 could be handled (immunisation).

* Due to closing of another plant, the production was increased by 50% in 1990. Thus, the staff reduction was marginal.

* Changed market strategy meant higher customer demands on quality. At the same time human relations at the plant was improved. This lead to better job satisfaction for the employees.

* Memories of negative experiences tends to fade as time passes. The stress survey was done 9 years after the first crisis. If the experiences had been surveyed shortly afterwards, the manifestations would have been stronger.

* Looking back, the needs for a change in the company was obvious to everyone. This tends to weaken the memories of the original experiences.

No changes in personal life style could be seen (smoking, drinking, use of medicines, exercise).

WHAT TO LEARN?

Plant management admits that the experience gained during the first crisis contributed considerably to the better handling of the second restructuring process. When looking back one can easily be too critical to how the 1985/86 crisis was handled.

This was the first crisis, and it was essential to create an understanding of the crisis. In 1990, the employees had this understanding. By far the major part of the staff reduction was done in 1985/86. Increased production contributed to make this a minor problem in 1990/91.

Still there are some important aspects:

* The importance of a strategy and plan of action in order to be able to run the process locally.

* Real involvement of representatives from the employees in the restructuring process makes them feel like participants instead of pieces in a game.

* Keep the employees continuously informed during the process in order to avoid rumours flourishing and development of insecurity.

Finally, we can conclude that management, poor or good, means a difference to the health of the employees.

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