

INTRODUCTION

Toxicophilia – “the love of toxics” – is the irresistible attraction, pathological of consumption of different toxic substances with special sensorial qualities (for example: a pleasant smell), because of the effect that they have on the psychic (they produce and /or intensify certain pleasant states or removes the unpleasant ones: pain, insomnia, fear, fatigue, etc.).

The existence, the place, the importance and the effects produced by the consumption of legal and/or illegal drugs are admitted in the whole world, and also in Romania. There have been made and are made intervention programmes, but those are more or almost exclusively focused on the legal drugs: tobacco, alcohol and varied drugs, capable of inducing toxicdependency. Also, in what regards the illegal drugs there have existed preoccupations, also on the global plan, but also in Romania in the last 20 years, but the majority of these programmes had as a main target young people, so the research have been done outside the professional, industrial medium.

The toxicophilia and the toxicdependency are forms of voluntary intoxication or involuntary (through the nature of the exposure) with different substances, legal or illegal, that may be present or not in the medium of work (especially in the industrial medium).

The possibility of developing addictive behavior (dependence) at the workplace (either due to the alcohol consumption, psychotrope substances or illegal drugs, or they appear due to the substances from the work medium, as it may be the case of the workers in the organic solvents sector, or it may be combined consumme) consisted until present a subject not taken into consideration, minimalized or pure and simple negated.

At the present moment there are few cases of intoxication with organic solvents that present a typical symptomatology. Usually, now appear forms of affection with less specific manifestations, subclinical, especially through behavioural problems, possibly evidenced through psychological tests.

We have considered that there is possibly an underestimated problem, but with after-effects and diverse implications on anything that life of a person means: work,

production process/developed activity, work security/accidents, decays, inclusively the aggravation of the pre-existent diseases (cumulation of noxes at the workplace), with possible consequences on the psychosocial life, and familial life.

The work comprises 365 pages, being structured in 11 chapters, the first 5 chapters in the general part, the next 6 chapters in the personal research part. The work is completed with an iconography that comprises 161 tables, 163 figures, 18 anexes, and in the studied bibliography for the finality of the study we have marked 251 titles.

THE GENERAL PART

This first part consists a synthesis of the literature information, for the delimitation of the main elements of the conceptual frame in which the research took place. The 1st chapter consists of the subjects: industrial toxics, intoxication, toxicity and the factors that conditionate it, individual predisposition, intolerance, tolerance, dependency, the pathogeny of the professional intoxications: toxicokinetics elements (the penetration and absorbtion of the toxics in the organism, the transport of the toxics in the organism, distribution, diffusion and toxic storage, elimination / excretion of the toxics, the methabolism of the toxics in the organism-biotransformation) and toxicodynamics.

In the 2nd chapter we spoke about the particularities of the actions os some toxics on the organism, defining and analyzing the terminology and different concepts: toxicophilia, drug, pharmacodependency–toxicomany, addiction, also notions regarding the types of consumme of the toxic substances - psychoactive, especially (the simple, customary consumme, the consumme at risk, intoxication, intolerance, adverse reactions, abuse, dopping, dependency - physical, psychic, tolerance), psychotropic, psychotoxicity, abstinence syndrome, residual state. We have analysed the factoris of individual susceptibility at the action of some toxics, general and professional: biological factors; psychological factors (inborn – proneness personalities (antisocial, “borderline” personalities, histrionic personality, dependents, the ones that are capables of taking decisions, the ones with anxious depressive disorders) and/or aquired– the cultural, familiar, social patterns); socio-professional

factors and behavioural psychological theories, according to which the dependency is not a behavioural problem. The chapter also included mentions linked to other groups of psychotropic toxic substances, such as: alcohol; opioid substances: heroin, morphine, codeine, nonsteroidal anti-inflammatory drugs, anticough agents, cocaine; inhalant substances; nicotine. Also, the risk factors from the environment and from the professional medium have been discussed, aspects linked to polytoxicomania and different socio-professional groups at which may be present the dependency syndrome, and also epidemiological information regarding drug abuse.

The 3rd chapter has as a theme the various types of organic solvents used at present in the production processes and their characterisation from the point of view of pharmacokinetic properties and their effects on the organism, being completed by the 4th chapter, with the description of the professional intoxications produced by the representatives of the main classes of industrial solvents.

In the 5th chapter we have presented few epidemiological aspects and statistical ones regarding the professional intoxications with organic solvents (at an international level, national and local).

THE PART OF PERSONAL RESEARCH

The part of personal research begins with the presentation of the work hypothesis, of the study material and study methodology. We started from the premise that the prolonged exposure at some industrial toxics, with aromatic smell, as for example organic solvents, may determine, in some workers, a subclinical symptomatology consisting from behavioural disorders that are manifested through the tendency of inhaling the toxic, with the perception of a pleasant state, that motivates the subsequent contacts. Those workers are susceptible of developing a pathology of professional intoxication on the fond of toxicophily, respectively of addiction of some toxics.

Few studies or researches in domain reveals a growing consume for the inhalant substances, especially among adults. Our paper proposes to evidenciate the importance and the gravity of the psychobehavioural effects of the professional exposure at organic solvents and to evidenciate the possibility and the manner in

which this exposure may determine the apparition of voluntary addictive behaviours, against those substances.

The aim of the paper is to evidenciate the possibility of developing toxicophily through professional exposure to organic solvents, finding and proposing technical measures, organizatoric and medical of prevention of the apparition of the dependency syndrome towards toxics, and the main study objectives referred to:

1. The evaluation of the professional exposure at organic solvents, through monitorisation in the work points (steady points);

2. The analyze of the health status and the frequency of distribution of the toxics consume: organic solvents, but also of “common drugs”, in general (alcohol, tobacco, coffee, etc.);

3. Determining the incidence of the toxicophily at COV;

4. Determination of the type of consume and psycho behavioral modifications, in the subjects occupationally exposed;

5. The suggestions of technical measures, organizatoric, psycho medical (for example: legislative modifications regarding the medical exam at the employment, adaptation and periodical control, promoting health at the workplace).

The study matherial consisted of the study lote (test lote: T), with 72 subjects, exposed at organic solvents, selectionated from two industrial units, that formed two sublotes (sublote H, formed from 50 subjects, chronically exposed to organic solvents (SO), from an enterprise of manufacture of musical instruments from Reghin, Mureş county and sublote C, formed from 22 subjects, chronically exposed at SO, from a n enterprise manufacturing components for auto vehicles from Sibiu (section Adhesive). The subjects in the exposed lotes H and C constitute the direct productive personnel, with exposure at the medium overloaded with SO between 85 - 100%, the most utilized types of SO being: acetone, 2-butanone, toluene, benzene, xylene, ethyl acetate, butyl acetate, butilic alcohol.

The witness lote (M lote) includes 72 subjects, not exposed at organic solvents, in an enterprise that manufactures auto vehicles components, from Sibiu.

In the work methodology we have analyzed and characterized the enterprises taken in the study – the work conditions, the concentrations of the main noxes (dust

suspension), volatile organic compounds (COV), and for the analyses of the health and predisposition of the consume of psychotrop toxics we have used as a research instrument the questionnaire. We have applied four types of questionnaires, as:

- the first questionnaire (in my own conception) assessed the aspects of the life style, stressing on appreciating the exposure (subjective) at organic solvents, neurotoxic, and also the inclination and/or tendency towards the consume of psychotrope substances (including alcohol and tobacco);
- the questionnaires 2 and 3 are questionnaires used in the psychological research, standardized, the first being a personality questionnaire (Zuckerman – Kulman: ZKPQ), and the second one is the inventory for depression BECK (BDI);
- the fourth questionnaire - EUROQUEST, also standardized, follows the main symptoms that appear in the case of chronic intoxication with organic solvents.

Applying all those questionnaires realised according to the deontological ethical norms in vigour (the respondents' s accord, keeping confidentiality of the obtained personal data).

Also, an analyse of some haematological indicators (hemoleukogram – haemoglobin, hematocrit, number of leukocytes), through the study of the results from the medical files of the employees.

The statistical processing of the data was done by a statistician, the programme used in this paper being SPSS (Statistic Program for Social Science), 10th version.

The results obtained were presented in the 8th chapter of the master's degree paper, and in the 10th chapter we presented the conclusions, as:

1. The results of the determinations of the noxes concentrations, analysed on a 4 years period revealed the overtaking of the normal values of the following noxes;
2. The distribution of the ancientness in the unit reveals statistically meaningful differences between the three lotes: H lote (23 years); C lote (4 years); M lote (15 years); over 90% from the subjects from the exposed lotes (H and C) are part of the group of the direct productive personnel and exposed at organic solvents;

3. The results of the questionnaire regarding the identifying data, the life style and work of the workers indicates 19 subjects that recognized that they like to voluntarily inhale, solvents, at the workplace: 50% at the exposed lote C (14% answered „Yes” and 36% „sometimes”) and 16% in the sublote H. In the witness lote 8.3% of the workers answered affirmatively, with „sometimes”, but the inhalation is produced outside the unit, so no professional exposure was observed.

4. The sensation created by the inhalation/smelling of the organic solvents is „pleasant: 9.7% from the subjects, respectively 14 persons: 8 from the lote M and 3 from the lote of exposed: H and C; “unpleasant”: 30% of the subjects, respectively 43 of the persons: 2 from the lote M, 9 from the lote C and 32 from the lote H; “indifferently”: 21% of the subjects, respectively 30 persons: 5 from the lote M , 10 from the lote C and 15 from the lote H.

5. The exposed C lote, followed by the exposed lote H has most cases with multiple symptomatology.

6. The majority of the smokers (at present and ex-smokers) are found again in the exposed lote, as the majority of the smokers in the group with the bigger frequency (10 – 19 cigarettes/day): the exposed lote C (73%), followed by the exposed lote H (50%).

7. The statistical process indicates a significant difference between the lotes, referring to the number of smoked cigarettes during the working schedule, the exposed didn't smoke so much.

8. Referring at the consume of alcohol, the majority of the respondents state that they are occasional alcohol consumers (90%);

9. The results of the evaluation questionnaire of the psychobehavioural manifestations – the personality questionnaire Zukerman-Kulmann (ZKPQ) indicates significative differences at the CIS scales (impulsively searching of sensations), N-A (neurotic-anxiety) and SOC (sociability), that differentiate the test lote of the witness lote. The general psychological aspect for the subjects of the test lote is characteristic for the inadaptated persons or with difficulties in the adaptation; that have an increased index of general anxiety; that are more retired from the social point of view; that have affective tensions unsolved and a tendency to emotional disorders. Those

characteristics may be correlated with a growing predisposition or bigger, reported to the media, for the consumption of toxic substances, psychotrop.

10. The results of the evaluation questionnaire of the depression degree – the Inventory for depression Beck (BDI) show that at the test lot (sublots H and C) exists a bigger number of subjects with depression, than in the witness lot, the cases having a greater severity. Most of the depression cases, easy and moderate are met in the old age. The younger ages are accompanied either by the absence of the depression, or by the severe depression. It is observed that the media of age of the men is smaller than that of the women on the scale “absence of the depression, easy depression”, the difference being statistically significant. It has also been remarked a statistically significant difference between the media of the number of years worked, inclusively in the same unit, between the subjects from the C lot, with a smaller media and the ones from the H lot, with a bigger media.

11. The results of the evaluation questionnaire of the chronic exposure at organic solvents – The symptoms questionnaire EUROQUEST marks statistically meaningful differences between the two lots test and witness (T and M), for 5 among the 11 domains of symptoms of the Euroquest questionnaire, as : 1st- domain – neurological signs; 2nd domain – psychosomatic signs; 7th domain – fatigue; 10 domain – anxiety; 11th domain – health and life quality. Also, we have observed that the sublot of exposed C differs less from the witness lot, in comparison with sublot H; sublot of exposed H differs more reported with the witness lot (as number of domains, and as a number of items, from each domain; there are differences between the exposed sublots, especially at the scales of 7-fatigue and 10-anxiety; age correlated statistically meaningful with the domains 1- neurological symptoms, 2- psychosomatic symptoms, 9- sensibility disorders and 10-anxiety, and the ancientness in the workfield with: 1- neurological symptoms, 2- psychosomatic symptoms, 7- fatigue, 10-anxiety.

12. The results of the haematological determinations (Hb, Ht, L) showed statistical meaningful differences between the exposed lot and the witness lot for the mean of the values of haemoglobin and haematocrite, at the test lot being

smaller than for the witness lot. The ancientness in the medium with organic solvents was in direct correlation with the levels of the two analysed parameters.

13. There have resulted few characteristics of the group of „consummers”: the ancientness of exposure bigger and/or the pleasure of inhaling determines reduced values of the haemoglobin and haematocrite, so a bigger or smaller degree of anemia; the ones in the exposed lote H have an age average bigger; the analyses of the connection between the pleasure of inhaling, age, general ancientness in work and ancientness in the medium with solvents, evidentiating that the sublote C comprises most of the subjects that inhale, being formed from younger persons, with a small mean ancientness in work, comparing those from the sublote H, where the age average, the ancientness in work and in the respective unit are bigger; the distribution of the alcohol consummers among those that inhale volatile compounds is of 90% (test group) and 100% (witness group); and the consumers group, that are distinguished in what regards the consume of sedative drugs, the ones in the witness group don't consume at all; the sum of their depressions („sum”) in the three groups of consumers, is statistically diferent: on the first place is situated group C, followed by group H and then by group M; the symptoms questionnaire Euroquest indicates a media of the rangs constantly bigger, in all the 11 domains, for the H and C groups, towards M lote;

The last chapters includes suggestions of improvment of the activity and health status of the workers. The implementation of the Europe Directive regarding the limitation of the COV emission in the industrial sectors that uses organic solvents, constitutes a provocation and obliges the enterprises to frame in the the prescribed limits of HG 699/2003, to monitorize and to permanently controll the COV emissions.

The application and development of all those activities has to include:

- Technico-organizatoric measures: the modification or changing of the technological process and of the equipment of application; the replacing or elimination of the covering matherials with bigger toxicity; the recovery of the solvents and their re-utilisation in the covering process; purification and filtration fittings of the overloaded air with COV; the education and surveillance of the personnel; usage of the technologies that realize

performant coverings; the usage of covering products with a smaller content of solvents; protection measures of individual protection –masks, gloves, etc.;

- Medical measures: the evaluation of the professional risk; the medical exam at the employment, with psychological evaluation; re-evaluation after a „period of adaptation” of 6 months; periodically medical control; adequate endowment of the medical cabinet of the unit for emergency situations; activities of promotion of the health care at the workplace (PSLM).

PSLM represents a new approach for the improvement of the health at the workplace, that is based on the action simultaneous of the employees, employers and of the society of improving the health and wellness status of the people at their workplace.

Promoting health at the workplace has two important aspects:

- an aspect that focuses on changing the individual behaviour, towards the adoption of a healthy life style;
- an aspect that focuses on the collective measures that may change, to maintain a healthy life style.

In conclusion I proposed an intervention programme PSLM in the two enterprises that were taken in the study, having as a theme the elements of the life style of the workers, stressing on the toxic substances, inclusively on the organic solvents.

SELECTIVE BIBLIOGRAPHY

1. MILDT (Mission Interministerielle de Lutte Contre la Drogue et la Toxicomanie): Conduites addictives et milieu professionnel. Rapport établi dans le cadre du Plan gouvernemental de lutte contre les drogues illicites, le tabac et l'alcool 2004 – 2008; <http://www.drogues.gouv.fr/> ;
2. Plan gouvernemental de lutte contre les drogues et les toxicomanies 2008-2011 (36), http://www.drogues.gouv.fr/IMG/pdf/Plan_gouvernemental_2008-2011-DF.pdf;
3. Voicu, A.V. , Toxicologie clinică, Ed. Albatros, București, 1997;
4. Tat, M., Medicina muncii. Orientare, patologie, practică, Ed. Viața Medicală Românească, București, 1999; 174-84, 193-98;
5. Cocârlă, A., (sub coordonarea), Medicina Ocupațională, Vol.II, Ed. Medicală Universitară "Iuliu Hațieganu", Cluj-Napoca, 2009;
6. Bardac, D.I., Stoia, M., Elemente de medicina muncii și boli profesionale, Ed. Mira Design, Sibiu, 2004;
7. Encyclopedie Medicine-Chirurgie, (Paris – France), Intoxication, Pathologie du travail. Lawerys, R., et Bernard, A.;
8. Harrison, J., Spai, O., Should Control measures be based on air measurements or biological effect monitoring?, Occupational Medicine (Oxford), 50 (1), 61 – 63, January, 2000;
9. Bălălău, D., Baconi, D., Toxicologie generală, Ed. Tehnoplast Company S.R.L., București, 2005 (28);
10. Niland, J., Cap.: "Industrial Hygiene", din "Occupational Medicine", Third Edition, Zenz, C., Bruce Dickerson, O., Horvath, E.P.Jr., Mosby-year Book, inc. 1994;
11. Cotrău, M. , Toxicologie - principii generale, Ed. Junimea, Iași, 1978 (76);
12. Niculescu, I., Todea, A., Toma, I., Pavel, A., Niculescu, R., Medicina muncii, Ed. Medmun, București, 2003 ;
13. Bardac, D., Stoia, M., Igiena industrială, Ed. Universității "Lucian Blaga", Sibiu, 2007 (54)
14. Popescu. Gr. A., Actualități în toxicologia de urgență, Ed. Militară, București, 1980 ;

15. Sursa: <http://www.scribde.com/sociologie/PRINCIPALELE-CATEGORII-DE-SUBS421618512.php>;
16. <http://www.etymonline.com/index.php?term=addiction>, Online Etymology Dictionary, Addiction ;
17. Hurwitz, N., British Medical Journal, 1969, 1:536–42;
18. Véléa, D., Toxicomanie et conduites addictives, Ed. Heures de France, 2005 (19);
19. <http://www.drogues-dependance.fr/s-informer-dependance.html> ;
20. Gelder, M., Gath, D., Mayou, R., Tratat de psihiatrie Oxford , Ediția a II-a, Oxford,
21. Textbook of Psychiatry, Oxford Medical Publications, 1994, (402);
22. <http://www.inrs.fr/inrs-pub/inrs01.nsf> ;
23. Lupu, I., Zanc, I., Sociologie medicală. Teorie și aplicații, Editura Polirom, Colecția “Bios”-Științe medicale, 1999 (182);
24. Harrison, Principii de medicină internă, vol I, II, a 12-a ediție, (a 2-a în limba română), Ed. Teora, 2001;
25. [\](http://www.nida.nih.gov/pubs/teaching/Teaching6/Teaching1.html)
26. <http://www.peele.net/lib/moa3.html>, The Stanton Peele Addiction Website, Peele, S., Alexander, B.K., The Meaning of Addiction Theories;
27. <http://www.5stepstoaddictionfreedom.com/> ;
28. Miller, G., Learning the Language of Counseling, John Wiley & Sons, New Jersey, 2005;
29. Drăgan, J., Dicționar de droguri, Ed. Național, 2000 (241);
30. Molto, J., Radel, C., Drogues, în Impact, Internat. Psychiatrie. Santé Publique, 1995, nr.21(115);
31. Gelder, M., Gath, D., Mayou, R. – Tratat de Psihiatrie, Ediția a II-a, Oxford, Editat de Asociația Psihiatrilor Liberi din România și Geneva Initiative on Psychiatry, 1994;
32. Crabbe, J.C., Belknap, I.J., Buck, K.J., Genetic animal models of alcohol and drug abuse, Science 264:1715, 1994;
33. Tănăsescu, I., Tănăsescu, G., Considerații privind toxicomania, Revista de Științe Juridice, (103);
34. <http://ar2006.emcdda.europa.eu/ro/page009-ro.html> - Raportul anual 2006 privind situația drogurilor în Europa;