Defense Mechanisms in Alcohol Dependent Patients with Oral and Oropharinal Cancer

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ABSTRACT

The effects of psychological factors in alcoholics with malignant tumor of the oral cavity and oropharynx are scarcely explored. The aim of the research was to examine early family relations and investigate differences in the use of defense mechanisms in alcohol dependent patients suffering from malignant tumor of the oral cavity and oropharynx compared to alcohol dependent persons without malignant tumors and healthy controls. The research included 51 alcohol dependent patients treated for malignant tumor of the oral cavity and oropharynx at the University Hospital Center Rijeka from 2005 to 2009. The control groups corresponded to the experimental group in age, sex and education level. The research used a general demographic questionnaire, the Mini International Neuropsychiatric Interview and the Revised Questionnaire of Lifestyle and Defense Mechanisms. The research groups showed significant differences in difficult childhood (p<0.001) including abuse (p=0.004). The alcohol dependent persons suffering from malignant tumors of the oral cavity and oropharynx significantly less frequently used primitive defense mechanisms of regression (p=0.004) and displacement (p=0.013) compared to alcoholics without malignant tumors who significantly more often used neurotic defense mechanisms – compensation (p=0.005) and intellectualization (p<0.001). The earliest emotional experiences and quality of family relations affect the development of defense mechanisms. These are the psychological factors in the development of oropharyngeal cancer in alcohol addicts.

Key words: defense mechanisms, oral and oropharyngeal cancer, alcohol dependent patients

Introduction

Alcohol dependence in today’s medical practice is clearly associated with a range of disorders and diseases among which malignant tumors of the oral cavity and oropharynx are quite significant1–5. Since alcohol has the form of small molecules, it easily passes through the mucous membrane lining the gastrointestinal tract and penetrates various cells, especially nervous tissue cells. It changes the structure of lipid cell membranes and partly melts them, alters the protein structure of cells and causes disruption of their functions6. Consummation of alcohol is also associated with differences in liver metabolic capacity which is determined by genetic differences7,8. Alcohol intake can induce the methylation of the p15 gene and start the process directly linked with cancerogenesis8.

While biological mechanisms of alcohol-induced malignant disease development are largely known, effects of psychological factors in alcohol dependence and development of malignant tumor of the oral cavity and oropharynx, as well as development of malignant diseases in general are almost unexplored. Causal relations between conscious and unconscious emotional conflicts and the dysfunction of organ systems has already been described10–12. Even though modern science confirmed and gave significant contribution to theories formulated at the beginning of the century that cancer is largely a psychosomatic disease, many questions remained unanswered13–15.

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One of the most important questions is why in certain mental disorders a disease affects particular organs or organ systems. Malignant tumors of the oral cavity and oropharynx affect areas which represent vital life functions – breathing, swallowing and speech. Furthermore, they significantly damage patients’ physical appearance. Considering the localization of the oral cavity and oropharynx, a question emerged as to the correlation between patients’ psychosomatic response and the oral stage of development. The oral stage lasts approximately from birth to one year. The mouth, i.e., oral cavity mucosa and mucosa-skin junction of the perioral zone act as the perception and gratification zone in this stage of development, which might indicate a significant psychological correlation between alcohol dependence and malignant tumor of oral cavity and oropharynx. The oral stage affects the formation of a person’s character; or least produces effect on the development of emphasized oral traits of personality. Major issue of persons with emphasized oral traits of personality is oral addiction as an expression of fixation (in symbolic terms: hunger for love). Due to inadequate relationship with parents in the earliest stage, but also in subsequent stages of psychological development, such persons can develop the punishing superego, which at certain moments responds to external frustrating factors by autoaggression. Autoaggression signifies a symbolic punishment, which can manifest itself in the form of cancer. In these circumstances, the disease can symbolize search for warmth, care and love. This way a person unconsciously expresses his/her constant need for parent figures who failed to provide adequate care and love. Defense mechanisms play an important role in regulation of fear and anxiety level in such complicated mental processes. Defense mechanisms are mental mechanisms used by a person in order to suppress or cope with anxiety and unpleasant traumatic experiences. Defense mechanisms have been a long standing concept in the field of psychology, dating back to Freud’s introduction of them as unconscious processes which modified or distorted reality to protect individuals from awareness of their own unacceptable thoughts, impulses or wishes. The definition of defense mechanism in the DSM-IV (Diagnostic and Statistical Manual of Mental Disorders) is as follows: “Defensive mechanisms are automatic psychological processes that protect the individual against anxiety and from the awareness of internal or external dangers or stressors. Individuals are often unaware of these processes as they operate. Defense mechanisms mediate the individual’s reaction to emotional conflicts and to internal and external stressors”.

There are several classifications and definitions of defense mechanisms, but most authors categorize them according to developmental stage in which they occur. Kellerman et al. researched the roles of defense mechanisms in regulation of emotions and found correlations between eight basic defense mechanisms and primary emotions. An individual can use combinations of defense mechanisms; nevertheless, some defense mechanisms usually dominate. Defense mechanisms differ in structure; ones are primitive, immature and they are formed during the oral stage of development (e.g. regression, displacement, projection) and others are formed in later stages of development. These are called neurotic defense mechanisms and they are more differentiated. Mature defense mechanisms develop last. Some authors classify defense mechanisms in accordance to whether they block impulses (reaction formation, repression, negation and intellectualization) or they liberate impulses (projection, compensation, displacement and regression). A series of researches demonstrated that persons without a clinically significant psychopathology have larger numbers of blocking defense mechanisms (reaction formation, repression, negation, intellectualization) and Valliant et al. say that the importance of immature mechanisms is in their use as tools for adaptation to stressful situations occurring in early interpersonal relations.

It could be assumed that alcohol-dependent patients suffering from malignant tumors of the oral cavity and oropharynx and patients who suffer only from alcohol dependence had equally inadequate and unsatisfactory family relations from the earliest period in their lives, but that the alcohol dependent persons managed to reduce the level of auto-destruction by selecting more mature defense mechanisms.

The aim of the study was to determine whether and how alcohol-dependent patients with malignant tumor of the oral cavity and oropharynx differ from alcohol dependent participants in their use of defense mechanisms and the assessment of quality of early family relations and to determine whether these two groups differ from healthy population in the same parameters.

**Participants and Methods**

**Participants**

Alcohol dependent patients diagnosed with malignant tumor of the oral cavity and oropharynx were the first group of participants. They had previously been hospitalized and undergone operation at the Clinic for Maxillofacial Surgery at the University Hospital Center in Rijeka, Croatia. The inclusion criteria were the following:

a) The diagnosis of malignant tumor of the oral cavity and oropharynx based on clinical examination according to the TNM classification, a generally accepted method of describing the extent of tumor in a patient’s body (T – describes the size of the tumor, N – describes metastases in regional lymph nodes and M – describes distant metastases), radiological (computed tomography – CT, head and neck ultrasound) and pathohistological biopsy verification of malignant disease,

b) The diagnosis of alcohol dependence according to the DSM IV (Diagnostic and Statistical Manual of Mental Disorders) by using the MINI (Mini International Neuropsychiatric Interview),
c) Absence of comorbid mental diseases (organic psycho-
syndrome and psychotic disorder),

d) Written informed consent for participation in the re-
search.

The diagnosis of malignant tumor of the oral cavity
and oropharynx was given by a maxillofacial surgeon ac-
cording to the set criteria. The patients were examined
by psychiatrists at the Clinic for Oral and Maxillofacial
Surgery, University Hospital Center in Rijeka where psy-
chiatric anamnesis was established for each patient and
where each patient responded to the MINI question-
naire. Seventy-nine patients were diagnosed with malig-
nant tumor of the oral cavity and oropharynx at the
clinic in the observed period. Nine patients (11%) did not
meet the criteria for the diagnosis, nine (11%) had an
associated psychoorganic syndrome, while ten (13%) re-
fused to give their written informed consent and were
therefore excluded from the research.

The final sample included fifty-one patients who sat-
ished all the inclusion criteria. Participants had the
mean age of 57.02±8.87. Eleven (21.6%) were women and
forty (78.4%) were men. Education level of the majority
of the participants was secondary (36 (70.6%)) or elemen-
tary (13 (25.5%)). Eighteen patients (33.3%) were em-
ployed, ten (19.6%) were unemployed and twenty-three
(45.1%) were retired. Thirty-four (66.7%) were married.

Methods

General demographic data were gathered by using a
written structured interview. The participants completed
the interview themselves. The interview consisted of
thirty questions, of which nine were multiple-choice que-
tions, eleven were yes/no questions and ten were ques-
tions with answers in the form of numbers. Twenty-
three questions referred to demographic data (sex, age,
marital status, number of children, education, employ-
ment status, economic status etc.) and eight questions
related to family relations, brothers and sisters, family
anamnesis, statements of a difficult and bad childhood,
childhood abuse, parents’ divorce, loss of a parent, a par-
ent’s remarriage and subjective economic status.

Psychiatric anamnesis was established for each pa-
tient and each patient responded to the MINI question-
naire. The MINI is a short structured interview used for
diagnosing alcohol dependence and/or psychotic disorder.
The MINI was developed by clinicians and psychiatrics
in the USA in the 1990ies according to the DSM-IV and
the ICD-10 (International Classification of Diseases 10th
Revision) classifications of psychiatric disorders. It was
designed to meet the needs for a short, but precisely
structured psychiatric interview for multicenter clinical
assessments and epidemiology studies. It takes 15 min-
utes to administer the questionnaire.27,32–34

Fig. 1. Participants »flow-chart« in the study.
Defense mechanisms were assessed by using a psychological measuring instrument called the Revised Questionnaire of Life Style and Defense Mechanisms, which had been described by H. Kellerman. The questionnaire examines forms of behavior significant for defining defense mechanisms. These forms of behavior are expressed in the lifestyle of individuals. The questionnaire statements are divided into eight dimensions of defense mechanisms (negation, regression, compensation, intellectualization, repression, displacement, projection and reaction formation). The questionnaire consists of 92 statements presented in the form of yes and no answers. It took approximately 15 minutes to administer the questionnaire and each patient was examined individually. The study was approved by the local ethical committee.

Statistical analysis

Statistical analyses were performed using the statistical package SPSS 11 for Windows operating system. Differences in the questionnaire results among the groups were tested by the one-way analysis of variance. The significance of differences among the groups was tested by using the LSD test. The \( \chi^2 \)-test was used for the assessment of differences in demographic characteristics. The significance level was set at 0.05.

Results

Demographic data and family relations

Statistical analysis showed that the three groups significantly differed in family anamnesis (\( \chi^2=58.852; \) ss=4; \( p<0.001 \)), in whether they had a difficult and bad childhood (\( \chi^2=16.541; \) ss=2; \( p<0.001 \)) and in whether they were abused during childhood (\( \chi^2=11.035; \) ss=2; \( p=0.004 \)). They also differed in whether they lost a parent (\( \chi^2=6.491; \) ss=2; \( p=0.039 \)), in whether their parents remarried (\( \chi^2=7.778; \) ss=2; \( p=0.020 \)) and in subjective economic status (\( \chi^2=20.298; \) ss=6; \( p=0.002 \)) (Table 1).

Defense mechanisms

We obtained statistically significant difference among the three groups concerning their use of the mechanisms of regression (\( F=5.785; \) \( p=0.004 \)), compensation (\( F=5.526; \) \( p=0.005 \)), intellectualization (\( F=8.605; \) \( p<0.001 \)) and displacement (\( F=4.473; \) \( p=0.013 \)). The LSD test was used as a post-hoc test in order to verify which groups showed statistically significant differences.

The LSD test demonstrated that the second group of participants used regression statistically more frequently (M=32.88±13.16) than the first group (M=23.00±16.12; \( p=0.001 \)). There was not any statistically significant difference between the second and the third group in the use of regression.

We found a statistically significant difference between the first group of participants (M=29.61±17.43) and the second group of participants (M=40.78±17.65; \( p=0.001 \)) in mechanisms of compensation. We have also obtained a statistically significant difference between the first (M=67.78±18.06) and the second group of participants (M=77.06±15.00; \( p=0.009 \)) and between the second (M=77.06±15.00) and the third group (M=62.71±19.77; \( p<0.001 \)) in the use of intellectualization.

As for the mechanism of displacement, we found a statistically significant difference between the first (M=16.47±17.30) and the second group (M=24.31±18.79; \( p=0.030 \)) and between the first (M=16.47±17.30) and the third group of participants (M=26.67±17.96; \( p=0.005 \)). All results are shown in Table 2.

TABLE 1

<table>
<thead>
<tr>
<th>THE CHARACTERISTICS OF FAMILY RELATIONS OF THE THREE GROUPS OF PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groups</td>
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<tr>
<td>Demographic questionnaire and family relations</td>
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<tr>
<td>Brothers or sisters</td>
</tr>
<tr>
<td>Cancer</td>
</tr>
<tr>
<td>Family anamnesis</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Nothing particular</td>
</tr>
<tr>
<td>Difficult and bad childhood</td>
</tr>
<tr>
<td>Childhood abuse</td>
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<tr>
<td>Divorced parents</td>
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<tr>
<td>Widowed parents</td>
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<tr>
<td>Parent’s remarriage</td>
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<td>Subjective economic status</td>
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</table>
The result of our research showed that the group of alcohol dependent participants with malignant disease of the oral cavity and oropharynx (the first group) had significantly damaged family relations, significantly more frequently reported difficult childhood and they had significantly more often been abused and traumatized, compared to the alcohol dependent participants without malignant diseases (the second group) and the participants without health problems (the third group). These results are in accordance with the proposed hypothesis. The results of our research are similar to results of researches exploring early family relations of alcohol dependent persons, frequent abuse in the early childhood and the psychological effects in adult age\(^{35-42}\). The results shown in the first group of participants are in line with researches done by Arnold, Rogers and Cook who say that the experience of sexual or other forms of abuse in childhood is often recognized in adult age through many somatic symptoms and physical diseases\(^{40,43-46}\).

According to our results, participants in the first group mostly had dysfunctional families, often without one parent, and often with poor economic status. More frequent childhood traumas might indicate inadequate care in the earliest developmental period, i.e., the gratification of the needs of a small child was insufficient and non-stimulating for psychological development during the oral stage. According to psychodynamic concepts, this leads to fixations in developmental stages, the oral stage in this case.

All groups of participants used both primitive and neurotic defense mechanisms. However, the groups differed in the profile of defense mechanisms. The first group significantly less frequently used primitive defense mechanisms of regression and displacement compared to other two groups. On the other hand, the group of alcohol dependent participants without malignant disease significantly more frequently used neurotic defense mechanisms of compensation (compared to the first group) and intellectualization (compared to other two groups). Other defense mechanisms (negation, repression, reaction formation, projection) were equally used by all groups.

These results considerably differed from our expectations that the group with malignant tumor would more frequently use primitive defense mechanisms, especially

<table>
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<tr>
<th>Defense Mechanisms*</th>
<th>Groups</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>F</th>
<th>p</th>
<th>LSD test</th>
<th>p</th>
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<td>43.73</td>
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<td>Group 3</td>
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<td>36.08</td>
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<td>51</td>
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<td>Group 2</td>
<td>51</td>
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<td>47.20</td>
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<td>Repression – neurotic defense mechanism</td>
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<td>Intellectualization – neurotic defense mechanism</td>
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<td>62.71</td>
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<td>Group 2</td>
<td>51</td>
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<td>17.96</td>
<td>Group 2 and 3</td>
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* The results were tested by one-way analysis of variance and LSD test

Discussion

The result of our research showed that the group of alcohol dependent participants with malignant disease of the oral cavity and oropharynx (the first group) had significantly damaged family relations, significantly more frequently reported difficult childhood and they had significantly more often been abused and traumatized, compared to the alcohol dependent participants without malignant diseases (the second group) and the participants without health problems (the third group). These results are in accordance with the proposed hypothesis. The results of our research are similar to results of researches exploring early family relations of alcohol dependent persons, frequent abuse in the early childhood and the psychological effects in adult age\(^{35-42}\). The results shown in the first group of participants are in line with researches done by Arnold, Rogers and Cook who say that the experience of sexual or other forms of abuse in childhood is often recognized in adult age through many somatic symptoms and physical diseases\(^{40,43-46}\).

According to our results, participants in the first group mostly had dysfunctional families, often without one parent, and often with poor economic status. More
compared to the healthy control group. Comparison with the literature data is hindered by the fact that most of the researches investigating defense mechanisms used different theories and instruments. According to our findings, this research is the first of its kind to work with the population of patients suffering both from malignant tumor of the oral cavity and oropharynx and alcohol dependence.

Intellectualization, as a defense mechanism typical for alcohol dependent persons, has already been described in literature. Rohsenow et al. demonstrate how alcohol dependent persons try to bring down the level of psychopathology by using intellectualization. Furthermore, in another study, these authors show that alcohol addicts use intellectualization as means towards a better social functioning. In psychopathological sense, alcohol addicts use intellectualization in order to find reasons to continue using alcohol as a model of reducing anxiety, even in cases when the first «defense line» of negation and projection becomes dysfunctional. The use of compensation would allow the first group to compensate symbolically or literally for the perceived emotional deprivation (by taking alcohol) to the extent that brings satisfaction. However, the first group failed to develop compensation mechanisms, probably as a result of a stronger traumatization in early developmental period and a poor quality of early emotional relations to primary objects. The use of alcohol could not compensate for oral needs (for love) of these participants, nor was this form of auto-destruction sufficient.

The group of participants with malignant tumor less frequently used defense mechanisms of regression and displacement. It is possible that this group did not manage to activate strong primitive defense mechanisms during psychological development. This finding is interesting considering the fact that literature describes regression as significantly present defense mechanism in patients with malignant tumors. These patients possibly failed to surpass the way of finding anxiety relief by means of the body in early stages of development. For example, at the earliest stage of development, a child can recognize and reduce anxiety only through the body since other mental mechanisms such as defense mechanisms are still not developed. Moreover, in such cases, fixation on this way of reducing anxiety remains the model of dealing with anxiety in adult age as well. Proper emotional stimulation provided by primary objects, the first caretakers, most often mothers, is necessary in order for a person to overcome this way of resolving anxiety. It is quite possible that a negative and unsupportive environment did not prefer the displacement of negative emotions on less dangerous, but secure objects. Dysfunctional families in which these participants grew up did not even have such objects. Regression also could not bring any relief, since it meant going back to periods of greater mental energy and security. If a person does not have such periods in life, regression loses its function as a defense mechanism.

Body language is the first «language» and emotional experience that a child can use and with which it is born. All mental mechanisms develop through the stimulation in the mother-child relationship. If the mother-child relationship is unsatisfactory and non-stimulating, development of defense mechanisms for reducing anxiety can be compromised. Furthermore, such emotional environment prefers emotional numbness and dissociation. Emotional numbness and dissociation are the mechanisms of «somatizing» of emotional conflicts, which are the key features of alexithymia.

It appears that inadequate use of certain, mostly primitive defense mechanisms, hinders the group of alcohol dependent patients with malignant tumor of the oral cavity and oropharynx in surpassing the bodily expression of emotions. The second group of participants (alcohol addicts) was less traumatized than the first group. Even though these participants were fixed at the oral stage of development, they managed to develop defense in the form of mental mechanisms that allowed for development of subsequent models of partial anxiety relief (through the stimulation of the oral cavity by alcohol intake and anxiolytic effect produced by alcohol) and thereby protected their bodies. In this case, primary objects were, to a certain extent, stimulating for the development of defenses formed in the early period. This finding shows that development of primitive defense mechanisms is as necessary and important as the development of neurotic and mature mechanisms. In other words, it proves that all defense mechanisms have their role and importance during psychological development. Furthermore, inadequate relations in early childhood produce destructive effects on both the body and the mind.

Limitations of our research can be found in a relatively small number of participants and in the use of only one model of assessing defense mechanisms.

Further researches should use more instruments for assessing defense mechanisms and early childhood trauma. Additionally, similar researches should be conducted with patients suffering from malignant tumors of other localizations.

Conclusion

Psychological factors play a role in development of malignant tumor of the oral cavity and oropharynx through emotional experiences, the quality of family relations in the early childhood and the set defense mechanisms used by a person.

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MEHANIZMI OBRANE U OVISNIKA O ALKOHOLU SA ZLOĆUDNIM TUMOROM USNE ŠUPLJINE I OROFARINKSA

SAŽETAK

Utjecaj psiholoških čimbenika u razvoju zloćudnog tumora usne šupljine i orofarinksa kod alkoholičara gotovo je potpuno neistražen. Cilj ovog rada bio je istražiti rane obiteljske okolnosti i razlike u korištenju obrambenih mehanizama bolesnika oboljelih od zloćudnog tumora usne šupljine i orofarinksa koji su ujedno ovisnici o alkoholu u odnosu na alkoholičare koji nisu oboljeli od zloćudnog tumora i zdravu populaciju. Ispitan je pedeset jedan pacijent, ovisnik o alkoholu obolio od zloćudnog tumora usne šupljine i orofarinksa u Kliničkom Bolničkom Centru Rijeka u periodu 2005–2009. godine. Uspoređene skupine bile su skupina alkoholičara i zdrave populacije istog broja ujednačene po dobi, spolu i naobrazbi. Primjenjen je opći demografski upitnik, MINI (Mini International Neuropsychiatric Interview) i Upitnik 'ivotnog stila i obrambeni mehanizmi (ŽS). Ispitne skupine su se značajno razlikovale po teškom djetinjstvu (p<0,001) uz zlostavljanje (p=0,004). Ovisnici o alkoholu oboljeli od zloćudnog tumora usne šupljine i orofarinksa znatno su manje koristili primitivne obrane regresiju (p=0,004) i premještanje (p=0,013) u odnosu na alkoholičare koji su znatno više koristili neurotske obrane kompenzaciju (p=0,005) i intelektualizaciju (p<0,001). Najranija emocionalna iskustva i kvaliteta obiteljskih relacija utječu na razvoj obrambenih mehanizama a to su psihološki čimbenici u razvoju zloćudnog tumora usne šupljine i orofarinksa.