

# Proposal to Prevent Alcohol Dependence Using Purpose in Life/*Ikigai* to Mimic the Chemical Effects of $\beta$ -Endorphin

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Received April 7<sup>th</sup>, 2012; revised May 2<sup>nd</sup>, 2012; accepted May 30<sup>th</sup>, 2012

Purpose in life (PIL)/*ikigai* is a social attitude based on the concept that, “every person has a need to establish meaning in life”. Comfort and pleasure are related to the secretion of neurotransmitters such as serotonin, dopamine and  $\beta$ -endorphin. Drinking alcohol can also trigger emotions and cause the secretion of  $\beta$ -endorphin. Persons, who have an inner sense of satisfaction, do not need or want to induce comfort and pleasure by using alcohol or morphine. The primary chemical structures of  $\beta$ -endorphin and morphine are similar. Therefore, it is possible that helping people to achieve PIL/*ikigai* could strengthen psychological and/or physical defenses against alcohol dependence.

**Keywords:** Purpose in Life/*Ikigai*; Alcohol Dependence; Pleasure; Anxiety;  $\beta$ -Endorphin

## Introduction

It is normal for a person to have ambition and to seek pleasure, comfort, and less anxiety (Diener, 1984; Kraut, 1979; Lu, Gilmour, Kao, Weng, Hu, Chem, Huang, & Shin, 2001). These behaviors indicate an active healthy brain and secretion of neurotransmitters which control the mind (Chaouloff, 1989; Comings & Blum, 2000; Esch & Stefano, 2010; Dalayeun, Norès, & Bergal, 1993). Successful adaptation to the environment causes pleasure and comfort which relate to a well balanced secretion of neurotransmitters such as serotonin, dopamine, noradrenaline, and  $\beta$ -endorphin (Chaouloff, 1989; Esch & Stefano, 2010). Anxiety is a signal that tells the individual to make adjustments to changes in the environment and situation (Selye, 1936, 1973) and causes an imbalance of neurotransmitters (Costa-Pinto & Palemo-Neto, 2010; Chaouloff, 1989).

Recently, two social attitudes, purpose in life (PIL) and *ikigai*, have been found to be related to ambition, comfort, pleasure and decreased anxiety even during various kinds of stressful situations (e.g., Ishida, 2008; Ishida, 2011, 2012; Ishida, Okada, & Bando, 2004). Drinking alcohol also causes comfort and pleasure and decreased anxiety (Dalayeun, Norès, & Bergal, 1993). PIL/*ikigai* (Ishida, 2012) and drinking alcohol (Dalayeun, Norès, & Bergal, 1993) are both accompanied by the secretion of  $\beta$ -endorphin.

Alcohol dependence is an important and serious issue in most countries. Therefore we propose that psychologically and physiologically methods can be used to prevent alcohol dependence.

## Frontal Lobe and Neurotransmitters

The frontal lobe, especially the prefrontal lobe, is more evolved in humans than in other mammals (Brodal, 1998; Brown, Keynes, & Lumsden, 2001). The prefrontal lobe connects with other areas of the brain via neuronal networks (Bro-

dal, 1998; Brown, Keynes, & Lumsden, 2001) and plays a role in ambition and mental integration functions (Brodal, 1998; Brown, Keynes, & Lumsden, 2001). Therefore, PIL/*ikigai* is thought to be a frontal lobe function (Ishida, 2012). In addition to internal need, repeated environmental stimulation strengthens the neuronal network (Mathon, Kamal, Smidt, & Ramakers, 2003). This process is related to repeated secretion of neurotransmitters (Mathon, Kamal, Smidt, & Ramakers, 2003). Serotonin as a neurotransmitter relates to the control of well balanced emotion, dopamine relates to motivation and pleasure, noradrenaline relates to anxiety and  $\beta$ -endorphin relates to decreasing pain and increasing comfort (Chaouloff, 1989; Comings & Blum, 2000; Costa-Pinto & Palemo-Neto, 2010; Dalayeun, Norès, & Bergal, 1993; Esch & Stefano, 2010; Mathon, Kamal, Smidt, & Ramakers, 2003). Therefore, personality manifestations based on social attitudes, i.e., PIL/*ikigai*, could depend on the neuronal network activity caused by the secretion of neurotransmitters (Böning, 2009).

## Stress

Selye proposed that stress included psychological, physical, and chemical factors (Selye, 1936, 1973). The autonomic nervous system helps the body adjust to changes in the environment and the person's situation, a defense mechanism referred to as homeostasis (Cannon, 1939). Stress can cause a non-specific response in the internal organs, such as adrenal cortex hypertrophy (Selye, 1936, 1973). Stress can also cause anxiety and an imbalance in the autonomic nervous system (Masaoka, Onaka, Shimizu, Sakurai, & Homma, 2007; Nagai, Wada, & Sunaga, 2002; Pollatos, Werner, Duschek, Schandry, Matthias, Traut-Mattausch, & Herbert, 2011). Anxiety accompanied by internal responses is a signal for the person to adjust to these changes, i.e., stress (Selye, 1936, 1973). Ignoring the signals and excessive continuous stress can cause disruption of the homeostasis function leading to psychiatric and somatic

disease and sometimes death (Selye, 1936, 1973).

### Mechanism of Purpose in Life (PIL) and *Ikigai*

PIL is drawn from existentialism that was developed in Europe (Ishida, 2011). *Ikigai* is a Japanese concept that dates back to the 14th century (Ishida, 2011). Both terms commonly propose the following: "Everything changes. Life is a onetime only event. Thus, every person has a natural and intrinsic need to achieve a meaningful life" (Ishida, 2011). Some psychological instruments for the measurement of PIL and *ikigai* have been developed (e.g., Crumbaugh & Maholick, 1964; Sato & Tanaka, 1974). Our studies show that PIL/*ikigai* negatively correlates with anxiety, psychiatric and somatic symptoms, and the need for approval from others (Ishida, 2011; Ishida, 2012). PIL/*ikigai* form a mechanism for the integration of psychologically stressful events in the past, present and future with less anxiety and less conflicts even during stressful situations (Ishida, 2011; Ishida, 2012). Additionally, PIL/*ikigai* provides a person with the ability to delay gratification, appreciate another's point of view, trust in a higher power, accept personal limitations, or count personal blessings (Ishida, 2011; Ishida, 2012). PIL/*ikigai* develops through positive experiences that occur from infancy to adolescence, such as spending time in beautiful natural surroundings, empathetic acceptance from others, and affection from others (Ishida, 2011; Ishida, 2012). On the other hand, excessive need for approval from others causes anxiety and conflict during stressful situations (Ishida, 2011; Ishida, 2012). Excessive need for approval from others develops when children are subject to excessive expectations from parents and teachers (Ishida, 2011; Ishida, 2012). There is strong evidence that PIL/*ikigai* can induce a physiological secretion of serotonin, dopamine, noradrenaline, and  $\beta$ -endorphin. Persons with PIL/*ikigai* are likely to demonstrate more independent spirit compared to those with excessive need for approval from others.

### Mechanism of Alcohol Dependence

Recent studies show that the  $\beta$ -endorphin system controls alcohol consumption (Dalayeun, Norès, & Bergal, 1993; Gianoulakis, Krishnan, & Thavundayil, 1996; Morales-Mulia, de Cortari, Amaya, & Méndez, 2012). Additionally, variation of  $\beta$ -endorphin secretion depends on drinking habits (Gianoulakis, Krishnan, & Thavundayil, 1996; Morales-Mulia, de Cortari, Amaya, & Méndez, 2012). Persons with PIL/*ikigai* show less anxiety, while those without PIL/*ikigai* demonstrate more anxiety (Ishida, 2011; Ishida, 2012). PIL/*ikigai* causes secretion of serotonin, dopamine, and  $\beta$ -endorphin (Ishida, 2012). Persons who have an internal sense of satisfaction are more likely to experience spontaneous feelings of pleasure and therefore they do not wish to drink alcohol or take morphine to alleviate pain (Nakata, 2006). Persons with anxiety attempt to induce pleasure by drinking alcohol (Dalayeun, Norès, & Bergal, 1993). PIL/*ikigai* triggers secretion of neurotransmitters such as serotonin, dopamine, and  $\beta$ -endorphin. Likewise, the brain reacts to alcohol with a similar neurotransmitter response. The primary structure of morphine and  $\beta$ -endorphin are comparable (Dragon, Seidah, Lis, Routhier, & Chrétien, 1977). By natural or chemically induced means, there is evidence that indicates that every person naturally seeks comfort, pleasure, and decreased anxiety. Successful treatment for addiction of drugs or alcohol (or other

types of addiction) results in the addicted individual's ability to experience an internal sense of pleasure, self-belief and self-efficacy (Levinthal, 1988; Peele, 1990-1991). This evidence suggests that establishing PIL/*ikigai* by positive experiences could prevent alcohol dependence. Additionally positive experiences, such as spending time in beautiful natural surroundings and acceptance of warm empathetic attitudes from others helps persons to establish PIL/*ikigai*.

### Future Study

Regardless of the importance of the alcohol dependence issue, the previous studies described above were studies about individuals. Other possible factors that influence alcohol dependence must also be considered. Therefore, totally integrated studies using experimental and epidemiological methods should be performed in the future; these studies include the chemical traits of neurotransmitters, development of PIL/*ikigai* and anxiety, alcohol dependence, effects of counseling for persons with alcohol dependence, and other possible factors influencing alcohol dependence. Additionally, other issues such as drug dependence, gambling problems, and the excessive need for approval from others which causes greater anxiety should be clarified.

### Conclusion

Every person has a *natural* need to have pleasure and comfort and to avoid anxiety. PIL/*ikigai* relates to the inner aspects of the brain, while drinking alcohol is an external and artificial mechanism. Both PIL/*ikigai* and drinking alcohol result in pleasure and comfort and secretion of  $\beta$ -endorphin. Therefore, we suggest that helping individuals to achieve PIL/*ikigai* may be one method of deterring alcohol dependence.

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