

**THE EFFICACY OF HOMOEOPATHIC SIMILIMUM
COMPARED TO A HOMOEOPATHIC COMPLEX IN
THE TREATMENT OF PROBLEMATIC PRIMARY
DENTAL ERUPTION.**

ORLEY MOYAL

Dissertation submitted in partial compliance with the requirements for the
Master's Degree in Technology: Homoeopathy in the Department of
Homoeopathy at Technikon Natal.

I, Orley Moyal, do hereby declare that this dissertation represents my own
work in both conception and execution.

Signature of Student

22nd Feb. 2002
Date of Signature

APPROVED FOR FINAL SUBMISSION BY:

Signature of Supervisor

05/03/02
Date of Signature

Supervisor: Dr Ashley H.A. Ross M. Tech. (Hom)(TN) B.Mus. (UCT)

DEDICATION

*THIS DISSERTATON IS DEDICATED TO BRYAN AND MY FAMILY IN
APPRECIATION OF ALL THE LOVE, HELP AND SUPPORT THEY HAVE
GIVEN ME AND FOR THE HOST OF OPPORTUNITIES THEY MADE
AVAILABLE TO ME.*

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ABSTRACT

The purpose of this study was to evaluate the relative effectiveness of Homoeopathic Similimum against a Homoeopathic Complex (Chamomilla 30CH Belladonna 30CH and Scutellaria lateriflora D6) in the treatment of problematic primary dental eruption, thereby expanding on previous homoeopathic research.

This study was a double blind randomised clinical investigation, which compared a Homoeopathic Teething Complex with Homoeopathic Similimum treatment. Thirty infants were selected for this study if they were between the ages of four months and three years and experiencing problematic teething.

The criteria for the study required that the infants involved exhibited the following signs and symptoms of teething: irritability, waking at night, biting and chewing objects, decreased appetite, increased thirst, diarrhoea without dehydration, hypersalivation, flushed cheeks or circumoral rash and swollen red gums.

Infants included in the study were randomly divided into two groups of 15. The one group consisted of infants treated with the Homoeopathic Teething Complex and the other group with Homoeopathic Similimum.

The efficacy of the treatment was measured by using a teething questionnaire, which was completed by the researcher during the initial and follow-up consultations. Due to the acute nature of the condition the total treatment period was four days. The data was then analysed by means of the non-parametric Mann-Whitney Unpaired Test and Wilcoxon's Signed Rank Test, due to the small sample size. The statistical package SPSS version 9+, was used for the data entry and analysis.

The Mann-Whitney test was used to compare the two groups of treatment to each other. This test was performed at the 5% level of significance. The results of this test showed that both similimum and complex treatment produced statistically significant differences after treatment, with the greater difference occurring in the similimum treatment group.

The Wilcoxon's sign ranked test was used to compare and analyse any difference between the initial and follow-up consultations. This test was performed at the 5% level of significance. The results of this test showed that a significant improvement occurred after treatment with both

similimum and teething complex. Similimum treatment, however, was seen to produce the greatest improvement.

Bar charts were used to graphically demonstrate the efficacy of both similimum and complex treatment. These charts also depicted that similimum treatment was more effective than complex treatment in the management of problematic primary dentition.

A summary of the patient profile and prescribed remedies showed that the most commonly indicated remedies were Sulphur and Pulsatilla, followed closely by Phosphorus. Of the three remedies used in the teething complex, only Chamomilla was prescribed and this was only in one case out of thirty.

From the results obtained in this study it was apparent that overall, similimum treatment was more effective than the teething complex in the treatment of problematic primary dentition. This was due to the fact that there was a greater degree of improvement, in a larger number of disturbances with similimum treatment as compared to the teething complex.

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DEFINITION OF TERMS

Complex remedy: " Combination remedy, a homoeopathic product which contains more than one remedy" (Yasgur 1998).

CH / Centesimal potency: Is a homoeopathic potency scale, introduced by Hahnemann, in which one part of mother tincture is added to 99 parts of diluent which is subjected to vigorous shaking or grinding known as succussion or trituration respectively. Each successive Centesimal potency refers to the number of successive 1 in 100 dilutions. (Gaier 1991: 84,432-441.)

Law of Similars: "....any substance which can produce a totality of symptoms in a healthy human being can cure that totality of symptoms in a sick human being" (Vithoulkas 1980:98).

Proving: The testing of a substance on healthy volunteers to discover and demonstrate the symptoms that substance is capable of producing and thus curing (Castro 1995:248).

Primary dental eruption: Also referred to as Deciduous dentition, Teething or Odontiasis (Stedman 1982). "Teething is the process by which an infants first deciduous (baby) teeth erupt through the

gums. Teething normally begins between 6-8 months of life...."

(Zand, Walton and Rountree 1994:385.)

Potency: A state of altered remedial activity to which a drug is taken by means of a measured process of deconcentration and the introduction of kinetic energy through the succussion or trituration. The rates of deconcentration are used in preparation of homoeopathic potencies. (Gaier 1991:432-441.)

Similimum treatment: The similimum is the remedy that matches the symptom picture of the patient most closely (Castro 1995). Similimum treatment is based on the principle 'let likes be cured by likes', that is to say, the same substance that causes a disease can cure it. Therefore this treatment consists of giving the patient in weak doses, the substance which, if given to a healthy individual, would cause symptoms similar to the patients' own pathological symptoms. (Jouanny 1991.)

Succussion: "The action of shaking up, or the condition of being shaken up, vigorously of a liquid dilution of a homoeopathic medicine in its phial or bottle, where each stroke ends with a jolt, usually by pounding the hand engaged in the shaking action against the other palm" (Gaier 1991:532).

CHAPTER ONE: INTRODUCTION

Although dentition is a natural process of development, in many children it is a trying one and may even result in latent tendencies to disease (Ruddock 1990:175).

For some infants, this period of their life is easy as they teethe without pain or fuss, while for others however, it can be a nightmare (Castro 1990:224), which may begin weeks before their first tooth actually erupts (Gorrie et al. 1994: 604).

Many parents have always considered the eruption of the first tooth as a major milestone in development (Valman 1995:99). At one time teething was considered the most common cause of death in infancy (Radbill 1965). In 1918 teething was still considered a dangerous pathology especially by dentists and pathologists (Dally 1996). However, since then teething has lost its status as a major cause of infant mortality and is no longer viewed as a serious or dangerous pathology (King 1994).

According to Leung (1989), many disturbances have been put down to teething, due to the fact that the actual origin of the disturbances is unclear. Three main schools of thought have been identified by Seward (1972) with regards to the relationship between the clinical symptoms and the eruption of the primary teeth. The first school of thought proposes that

teething produces a great many disturbances, systemic and local in nature. This is referred to as 'dentitio-difficilis' (pathological dentition), whereby a cause and effect relationship exists between the eruption of the primary teeth and clinical symptoms. The second school of thought claims that mild disturbances are a common and expected consequence of what is primarily a normal physiological process. Lastly there are those who claim that eruption of the dentition will produce teeth and nothing more. Ring (1994), sees teething as a normal physiological process necessary to prepare an infant for the chewing of food, once its maternal supply ceases. Holloway and Swallow (1982:141) suggest that the truth about whether 'teething only produces teeth' or whether other pathological symptoms can be attributed to the process, lies somewhere between these two extremes. As a result of this way of thinking, only a few mild disturbances, as opposed to many, are seen as being common and expected consequence of the teething process (Seward 1972).

According to Honig (1975), the majority of information obtained on teething, is parental opinion. Many mothers today, still consider teething to be an ailment and commercial interests attempt to foster these anxieties in both mothers and doctors (Dally 1996). Such convictions have resulted in various over-the-counter medication being marketed, ostensibly to relieve any discomfort associated with teething. The problem is that people (parents or physicians) who believe in a causal

association between teething and symptoms tend to look in the baby's mouth only when the child is symptomatic. (Goldbloom 1992:36.)

Another major problem with this approach is that most teething remedies contain substances, which if misused can be harmful to the infant. These substances include salicylates, which result in salicylate poisoning (Parkin 1991:171), and analgesics, which can result in toxic conditions (McDonald and Avery 1994:139). Edge (1986:217) comments that in the past such medications have caused considerable harm and may even be unnecessary.

Homoeopathy, however, could offer a safer, and healthier alternative as suggested by Jacobs (1994). She also proposes that many minor ailments can be treated effectively with homoeopathic remedies thereby strengthening the overall defense mechanisms of the body. Castro (1992) has found, through clinical experience, that homoeopathic treatment can ease the pain of teething. The author states that homoeopathy is also effective in facilitating the eruption of teeth that are having difficulty in breaking through the gums. Steinlechner (1984:145) claims that homoeopathy is useful in the dental treatment of inflammation, redness and swelling of the gums, all of which can be found in a teething child. Homoeopathy is also known to quickly ease the pain and distress of teething with minimum fuss (MacEion 1994: xv).

"Correct homoeopathic prescribing for dental maladies will frequently provoke salutary systemic effects. This is simply a reflection of the natural course of cure and illustrates the fact that the dental apparatus is an indivisible component of the integrated whole person."(Varley 1998:35.)

Recent clinical trials carried out by Lever (1998), as well as Eldridge (1999), on the homoeopathic treatment of teething have substantiated and conferred credibility to these claims. Both these trials researched the efficacy of homoeopathic complex. It was suggested by Lever (1998), that the use of homoeopathic similimum would yield better results. The reason being, that it was found by the researcher that the symptoms presented by each individual patient did not always correspond to the symptom picture of the remedies that constituted the homoeopathic complex being researched (Lever 1998). The use of the similimum remedy for each patient would allow for this individualistic treatment. Since the similimum is that remedy that is most similar to the totality of symptoms (Dancu 1996).

Homoeopathy respects the complexity and uniqueness of each individual (Zand et al.1994:26). Yasgur (1998) describes individualistic treatment as a process whereby one patient is differentiated from the other patient, while suffering from the same nosological condition / pathology. Homoeopathy understands the individuality of each patient or case. The entire examination of a patient is conducted with a view to discover not

only the general or common features of the case, but by the symptoms which differentiate that case from others of the same general case (Das 1998). Often the symptoms and signs one sees in the oral cavity are early indications of more distant pathological processes in the gastro intestinal tract, the skin and its appendages (Steinlechner 1984:145). An appropriate constitutional (similimum) remedy can help prevent illness as well as maintain and support optimal health (Zand et al. 1994:26).

Research on the use of Homoeopathic Similimum in the treatment of problematic teething, has never been carried out. A clinical trial would therefore help substantiate and offer credibility to this mode of homoeopathic treatment as well as the above claims.

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

2.1 Historical Overview

Throughout history, parents have been unable to rejoice until their child had safely survived the period of dentition (Radbill 1965). As the years have passed ideas relating to the causes and treatment of teething have evolved according to time (Eldridge 1999).

Theories relating to teething problems can be dated as far back as 3000BC, in Sumerian literature. During this time it was believed that the cause of dental pain was due to a worm eating away at the tooth (Radbill 1965).

In 1000BC, the Atharva-Veda compared tooth eruption to "two tigers on the rampage". The ancient Hindus also associated tigers with teething, however in their culture tigers were seen to symbolize death. (Radbill 1965.)

It is, however, the work of Hippocrates, in the 4th century BC that formed the basis for teething literature. Hippocrates claimed that tooth

development began while the embryo was still in the uterus, from where they were seen to derive their nourishment. After birth teeth erupted and obtained nourishment from mother's milk, hence known as "milk teeth". In his book on Aphorisms, Hippocrates listed in the 25th aphorism: "At the approach of dentition, itching of the gums, fevers, convulsions and diarrhoea occur." These symptoms have since been associated with and enlarged upon by the world's greatest medical experts. (Radbill 1965.)

According to Kiple (1993), the earliest "pediatric" text known to us was that of Soranus of Ephesus (around A.D. 100), on gynaecology in which he discussed teething, amongst other pediatric conditions. Radbill (1965) has also been able to trace literature records on teething in the Homeric hymns, the work of Pliny, Aristotle, Galen, Celsus, Oribasius, Aetius and all subsequent medical texts dealing with children to the present day.

It was only during the middle ages, however, that people started paying more attention to children as well as ways in which to increase their survival rate. This change occurred, as they could no longer afford for their children to die while they were "teething", as heirs for thrones were needed. (Kowitz and Loevy 1993.)

At one time teething was considered the most common cause of infant mortality (Radbill 1965). During the 18th century almost half of all deaths in infancy in France were ascribed to "teething troubles" (Koch et al.

1991:273). In 1839 in England and Wales, 5016 deaths were attributed to teething (Dally 1996). According to the Registrar General's report, in 1842 teething was the registered cause of death in 4.8% of all of all infants under the age of one year and 7.3% of those between the ages of 1 and 3 years (Jaber et al. 1992). In 1910 however, the number of deaths in England and Wales was seen to diminish to 1600 (Dally 1996).

According to Ring (1994), some of the more ancient treatments of teething included application of, roasted brain of hair, or milk of a bitch, to the gums. Dally (1996) also adds to this list of ancient treatment, blistering, bleeding, placing leeches on the gums and applying cautery to the back of the head. It was only during the sixteenth century that a less violent and more professional form of treatment emerged, namely, lancing of the gums. This mode of treatment was first introduced by a French surgeon, Ambrose Pare (1510-1590 AD), who got the idea after he examined the autopsy of a baby. By the 18th century lancets had become a symbol of the profession and were carried by all physicians and surgeons. (Dally 1996.) According to Ring (1994), it appeared as though the sole purpose of 18th century dentists was to assist the teeth to erupt, a process they were led to believe was beset by grave dangers.

In the early 1800's dentists continued to make progress in the treatment for teething in children, however lancing of the gums still predominated management of teething at this time (Ring 1994). During the latter part of

the 19th century some doctors began to dispute the accepted treatment of teething, and the diversity of opinion on the subject caused contention within the medical profession. Lancing of the gums eventually began to decline since the elaborate knives and lancet cases that were being used became seen as being potentially dangerous. This was due to the adoption of the germ theory and the development of antiseptics and asepsis in surgery. (Dally 1996.)

Over the years teething as a disease entity has subsequently lost its status as a major cause of infant mortality and is no longer viewed as a serious or dangerous pathology (King 1994). Treatment has thus also evolved to the current more subtle and unobtrusive mode of treatment (Eldridge 1999).

2.2 Tooth Development

During the embryonic period of development, the initiation and growth of the oral structures from the ectoderm and mesoderm occurs. This develops within the first eight weeks of intra-uterine life. (Richardson and Barton 1970:113.) However, the primary teeth begin to develop as early as the sixth week of embryonic life (McDonald and Avery 1994:53). Calcification of the primary teeth begins in utero 13 to 16 weeks. By 18-

20 weeks post fertilization, all the primary teeth have begun to calcify (Ash 1993:33).

The process of tooth development can be divided into several stages namely, initiation or bud stage, proliferation or cap stage, histodifferentiation or bell stage and morphodifferentiation, apposition, mineralization and calcification (Stewart et al. 1982:87).

2.2.1 Initiation / bud stage :-

Tooth development begins when the basal layer of cells in the oral epithelium proliferate faster than the adjacent cells. This is referred to as Odontogenesis. (McDonald and Avery 1994:53.) There is growing evidence that the ectomesenchyme derived from the neural crest provides the primary induction factor in odontogenesis (Stewart et al. 1982:87). Differentiation of odontogenic tissue results in the development of bands of thickened epithelium known as the dental lamina (McDonald and Avery 1994:53). These lamina have been identified in the human embryo as early as the twenty-eighth day of gestation (Stewart et al. 1982: 87). Ten ovoid swellings occur in each dental lamina in positions that are later occupied by the primary teeth (McDonald and Avery 1994:53). The anterior maxillary teeth are derived from the dental lamina in the frontonasal process, and the posterior maxillary teeth from the

paired lateral maxillary processes. The mandibular dentition develops from the two (right and left) initial dental lamina sites in the mandibular arches. (Stewart et al. 1982:87.)

2.2.2 Proliferation / cap stage :-

Each of these ovoid swellings continues to proliferate, resulting in the formation of a tooth germ or bud (Richardson and Barton 1970:113). Each tooth germ consists of both ectodermal and mesodermal cells and is composed of three parts namely the dental / enamel organ, the dental papilla and the dental sac or follicle (Ibsen and Phelan 1996:214). Projections of the dental lamina extend into the underlying mesenchyme at specific locations and form the primordia of the primary dental / enamel organs. As cells proliferate, they increase the size of the dental organ. (Stewart et al. 1982:90.)

2.2.3 Histodifferentiation and morphodifferentiation :-

The anterior primary tooth germs undergo histodifferentiation and begin morphodifferentiation during the first six weeks of intrauterine life. The second primary molar germs normally appear at about the seventh week. (Stewart et al. 1982:92.)

During development of the enamel organ, a series of cellular changes occur within the tooth germ, resulting in the formation of four distinct layers namely, the outer dental epithelium, the stellate reticulum, the stratum intermedium, and the inner enamel epithelium. These layers develop before any enamel formation. Prior to the formation of enamel matrix, the enamel organs produce cells, called ameloblasts. These cells in turn exert an influence on adjacent mesenchyme to differentiate the cells of the dental papilla to form preodontoblasts. These cells differentiate into odontoblasts. (Stewart et al. 1982:93.) The ameloblasts and the odontoblasts are responsible for the production of dental hard tissues namely enamel and dentin respectively. Finally, differentiation of cells of the dental sac produces cementum. (Ibsen and Phelan 1996:214.)

2.2.4 Apposition :-

Enamel and dentin are only produced in the fifth month of gestation (Ibsen and Phelan 1996:214). An enamel matrix and dentin matrix, are formed from the dental hard tissues (Richardson and Barton 1970:160). Enamel matrix is deposited at the occlusal or incisal surface of the developing tooth. As this process continues in these regions, additional ameloblasts form apically creating the cervical loop and eventual formation of the epithelial diaphragm. (Stewart et al. 1982:94.) The

enamel matrix and dentin matrix are necessary for the reception of calcium and phosphorus salts (Richardson and Barton 1970:160).

2.2.5 Mineralization and Calcification :-

Mineralization of the dentin matrix :-

Although it is understood that collagen forms the matrix of all calcified tissue, with the exception of enamel, it is still not clear whether collagen should be considered the sole molecule responsible for initiating and completing the mineralization process (Stewart et al. 1982:100). Carmichael et al. (1971) present evidence for existence of a phosphoprotein in dentin that is covalently bound to collagen. This protein has an amino acid composition distinct from that of collagen. The end result of mineralization of the dentin matrix is hydroxyapatite, which is the crystal structure characteristic of all mineralized tissue (Stewart et al. 1982:100).

Mineralization of the enamel matrix:-

This process occurs through apatite crystal nucleation and begins either immediately after matrix production or concomitantly with matrix secretion. The mineralization process occurs in three general phases. The first phase is the rapid deposition of the apatite crystals. The second phase involves growth in width and thickness. At this stage matrix

production is essentially complete. In the third stage enamel reaches its final high level of mineral content and thus defined as matured. (Stewart et al. 1982:100.)

Maturation of enamel and calcification :-

This process of maturation occurs periodically during stages of ameloblast production and continues through the time the tooth erupts. Mineralization proceeds slowly and initial calcification begins at five months of age at the incisal edges and a little later at cusp tips of the molars. Calcification occurs earlier in girls than in boys and is a relatively symmetric process with the various stages of crown and root formation of contralateral teeth being alike on both sides of the arch in 85% to 97% of cases studied. (Stewart et al. 1982:100-101.) During calcification, calcium and phosphorus salts precipitate within the matrix resulting in the hardening of the matrix. The initial precipitation is small and is known as a nidus. A homogeneously mineralized layer of tissue matrix results from the fusion of precipitation layers around the nidus. (McDonald and Avery 1994:55.) Postnatally, completion of crown and root formation of the primary dentition is usually terminated with apical closure of the mandibular canine at about 3 years of age (Stewart et al. 1982:101).

Chronology of human dentition of deciduous dentition (McDonald
and Avery 1994:187).

Tooth	Beginning of hard tissue formation	Amount of enamel formed at birth	Enamel completed	Eruption	Root completed
<u>Maxillary:</u> Central incisor	4 mo in utero	$\frac{3}{6}$	1 $\frac{1}{2}$ mo	7 $\frac{1}{2}$ mo	1 $\frac{1}{2}$ yr.
Lateral incisor	4 $\frac{1}{2}$ mo in utero	$\frac{2}{3}$	2 $\frac{1}{2}$ mo	9 mo	2 yr.
Cuspid	5 mo in utero	$\frac{1}{3}$	9 mo	18 mo	3 $\frac{1}{4}$ yr.
1 st Molar	5 mo in utero	Cusps united	6 mo	14 mo	2 $\frac{1}{2}$ yr.
2 nd Molar	6 mo in utero	Cusp tips still isolated	11 mo	24 mo	3 yr.
<u>Mandibular</u> central incisor	in utero 4 $\frac{1}{2}$ mo	$\frac{3}{5}$	2 $\frac{1}{2}$ mo	6 mo	1 $\frac{1}{2}$ yr.
Lateral incisor	4 $\frac{1}{2}$ mo in utero	$\frac{3}{5}$	3 mo	7 mo	1 $\frac{1}{2}$ yr.
Cuspid	5 mo in utero	$\frac{1}{3}$	9 mo	16 mo	3 $\frac{1}{4}$ yr.
1 st Molar	5 mo in utero	Cusps united	5 $\frac{1}{2}$ mo	12 mo	2 $\frac{1}{4}$ yr.
2 nd Molar	6 mo in utera	Cusp tips still isolated	10 mo	20 mo	3 yr.

2.3 Tooth eruption

Stewart et al. (1982:105) describes tooth eruption as the changes in tooth position from the earliest time of development through successive stages to emergence into the oral cavity. This also includes achievement of occlusal contact and subsequent changes caused by growth of the facial skeleton.

Factors considered, by most authors, to be primary influences in the mechanism of tooth eruption are, growth of the root and dentin, growth of the alveolar bone, pressure from cellular proliferation of the Hertwig epithelial sheath, pressure from the pulp, or pressure from adjacent musculature (Stewart et al. 1982:106). In 1941 Massler and Schour accumulated evidence discounting all of the aforementioned factors and proposed instead, that changes in the vascularity of the periodontal tissues influence teeth to erupt (Foster 1992:65). More recent literature suggests that tooth eruption is a function of the connective tissue of the periodontal ligament surrounding the root (Jorgenson 1983:11). The latest studies however, show that once the crown formation is complete, growth of the pulp tissue at the basal end of the tooth leads to the upward movement of the primary tooth away from the base of the follicle. Various hormones and resultant growth changes in the jaws also influence this upward movement.

Growth hormones stimulate the basic growth process that occurs, whilst thyroid hormones control the differentiation and maturation processes. (Leung 1989.)

Shortly before the erupting tooth pierces the gingival mucosa, a whitish area is seen corresponding precisely to the imminent point of breakthrough. This area corresponds to the keratinization of the fused dental and oral epithelia. The exposure of the tooth occurs a few days later. (Foster 1992:65.) At this time of upward movement of the primary tooth, there is a downward growth of Hertwig's epithelial root sheath, which is responsible for controlling root formation (Leung 1989). Due to this simultaneous movement, tooth eruption takes place before the root is fully formed. It therefore takes 2-3 years after the tooth has erupted, for the root to be formed and calcified. Cementum, which is responsible for covering the roots and providing a place of attachment to the gums (Richardson and Barton 1970:99,113,160), is only produced once the crown formation is complete (Ibsen and Phelan 1996:214).

2.4 Age Of Eruption

Genetic, environmental and systemic factors influence tooth eruption. Familial patterns of eruption are common, and race and sex demonstrate high correlation with altered timing of tooth eruption. Birth weight has a

positive correlation with altered eruption times, while nutrition has a low correlation. (Jorgenson 1983:11.)

Delayed eruption may be due to systemic disorders and has been associated with several syndromes (Stewart et al. 1982:107). Delayed eruption times of deciduous and permanent teeth are seen in Down syndrome, cleidocranial dysplasia and in endocrinopathies such as hypopituitarism and hypothyroidism (Jorgenson 1983:11), as well as in several types of craniofacial synostosis and hemifacial atrophy (Stewart et al. 1982:107).

Precocious eruption is rare but is seen in cases of hyperthyroidism and hemifacial hypertrophy as well as in affected areas of the dental arch in Sturge-Weber syndrome.

Deciduous teeth that emerge before the first 3 months of life are referred to as premature teeth. Those that are present at birth are called natal teeth and those that erupt in the neonatal period, from birth to 30days, are designated neonatal teeth. Natal and neonatal teeth are reportedly associated with three syndromes: chondroectodermal dysplasia, Hallermann- Streiff syndrome and pachyonychia congenital. (Stewart et al. 1982:108.)

According to Duncan (1991:259), the primary teeth do not start pushing through gums until about four months of age. A new eruption may then occur approximately every month (Leung 1998). It takes from 2 to 3 years for the primary dentition to be completed, beginning with the initial calcification of the primary central incisors to the completion of the roots of the primary second molar (Ash 1993:33). It is however, also true that the age at which infants are seen to teethe may vary greatly. This is because some infants are seen to be born with teeth whilst others only teethe at 13-14 months of age. (Illingworth 1991:77.)

Investigations of the chronology of emergence of the primary teeth in different racial and ethnic groups reflect considerable variation (Ash 1993:34). World population differences in tooth standards suggest that there are patterned differences that may not be large (Ash 1993:34).

Recently a longitudinal study was conducted by Ramirez et al. (1994) on primary tooth eruption in 114 Spanish children in two Primary Care Centers in Madrid over a three-year period. The object of the study was to evaluate the age and order of eruption of the primary dentition in their population of Spanish children. When the findings of this study were compared to studies performed in other populations, it was established that the ages and order of tooth eruption in Spanish children are similar to those found in other populations. In this study the following ages for eruption were noted.

Ages of eruption in months for the total population (means with standard deviations)

Primary tooth	Right	Left	Pair
Maxilla:-			
Central incisor	9.48±2.13	9.37±2.10	9.42±2.11
Lateral incisor	10.74±2.11	10.58±2.29	10.66±2.20
Canine	18.78±3.07	18.62±3.01	18.70±3.03
First molar	15.27±1.91	15.28±1.97	15.28±1.93
Second molars	26.88±3.96	26.66±3.94	26.77±3.93
Mandible:-			
Central incisor	7.19±1.76	7.21±1.80	7.02±1.78
Lateral incisor	12.06±2.92	12.46±3.08	12.26±3.00
Canine	19.01±3.23	19.05±3.36	19.03±3.28
First molar	15.79±2.21	15.61±2.21	15.70±2.20
Second molar	25.65±3.60	25.29±3.43	25.47±3.53

Eruption times between the two sexes were also compared in this study, and it was found that boys tended to have an earlier eruption time than girls.

Difference in eruption times (in months) between boys and girls.

Positive sign indicates earlier eruption in boys.

Primary tooth		P _≤
Maxilla:-		
Central incisor	+0.56	Ns
Lateral incisor	+0.96	0.05
Canine	+0.80	ns
First molar	+0.24	ns
Second molars	+1.14	ns
Mandible:-		
Central incisor	+0.75	0.05
Lateral incisor	+1.95	0.0001
Canine	+1.66	0.05
First molar	+0.21	ns
Second molar	+0.03	ns

2.5 Order of tooth eruption

The normal eruption order of the primary dentition is similar in all populations (Stewart et al. 1982:106). The predominant sequence of eruption in the individual jaw is central incisor, lateral incisor, first molar, canine, and second molar (Ash 1993:35).

A longitudinal study carried out by Ramirez et al. (1994) observed 60 infants, 35 boys and 25 girls, from the time of their first tooth eruption to their last tooth eruption. This study confirmed that the most common order of eruption was, central incisors, lateral incisors, first molars, canines and second molars.

In the maxilla this order was found in 87.5% of boys and 84% of girls. In the mandible this order was found in 84.3% of boys and 76% of girls. Considering both jaws together, the most frequent order found was mandibular central incisors, maxillary central incisors, maxillary lateral incisors, mandibular lateral incisors, maxillary first molars, mandibular first molars, maxillary canines mandibular canines, mandibular second molars, maxillary second molars. This order of eruption was seen to occur in 28% of the boys and 20% of the girls or almost 25% of this total group in which full dentition data was obtained.

If one takes into consideration the fact that there was no statistically significant difference found in the order of eruption of the first molars and canines, and this information is thus ignored, the order of eruption increases to 59.3% in boys and 48% in girls, which is more than half of the total group. Other orders were the eruption of any first molar before the eruption of at least one mandibular lateral incisor, which was found in 12.5% of boys and 20% of girls, and the eruption of a maxillary lateral incisor before at least one maxillary central incisor, which was found in 9.3% of boys and 12% of girls.

Most studies have indicated that eruption patterns may also be affected by environmental as well as genetic factors. Socioeconomic levels, which affect nutrition, personal hygiene, and related factors, have also been linked to retarded eruption of anterior teeth and accelerated emergence of posterior teeth. (Stewart et al. 1982:107.) Some variations in the order of tooth eruption may be due to reversal of central and lateral incisors, first molar and lateral incisor, or eruption of two teeth at the same time. Jaw reversal in eruption of canines and first molars has been found to be important in increasing the variety of sequences, as well. (Ash 1993:35.)

2.6 Complications

Various cases and clinical observations have shown that both systemic and local complications may occur.

2.6.1 Systemic complications :-

Two episodes of severe graft versus host disease (GVHD) have been described by Shapira et al. (1996). These episodes developed in a teething 5 month-old girl with severe combined immunodeficiency (SCID). Whilst receiving bone marrow transplantation treatment, the infant developed two episodes of severe GVHD during teething. A dramatic improvement in GVHD was noted after the completion of tooth eruption. As a result it was suggested that the release of interleukin-1, associated with the traumatized gingival tissue, was the triggering mediator for the GVHD. Since the occurrence of GVHD in SCID, receiving bone marrow treatment is low, it is believed by these authors that teething should be added as a known triggering factor for GVHD.

2.6.2 Local complications :-

2.6.2.1 *self inflicted gum injuries* :-

Self inflicted injuries most frequently involve the gum margins or papilla (Andlaw and Rock 1996:187). As the tooth forces its way through the gingiva, this sack ruptures. Infants who bite on hard objects may injure their gingiva causing premature rupture, which may result in infection. (Foster 1992:65.) Another commonly noted cause is the use of fingernails or other sharp objects, by the infant, in an attempt to gain relief from the pain (Andlaw and Rock 1996: 187). Vaughan (1993) discusses self-inflicted oral injuries under the term 'gingivitis artefacta' or 'factitial gingivitis'. He describes a case of a 15 month-old child with the habit of forward posturing of the mandible. On intra-oral examination, two areas of marked ulceration were noted on the lingual aspects of the mandibular incisors. This correlated precisely with the opposing central incisors. Due to this, Vaughan (1993) suggests that these injuries were irritated by the teething process since the habit was seen to cease and the ulceration to heal completely, once the teeth had erupted. Self inflicted gum lesions may also occur as a result of psychological factors, such as an unhappy emotional background, or secondary to thumb sucking and the use of a pacifier (Vaughan 1993).

2.6.2.2 *Operculum gingivae*

After eruption, soft tissue often remains in the distal portion of the tooth's occlusal surface for a relatively long time. This is referred to as 'operculum gingivae'. When tooth eruption occurs early in relation to the growth of the jaw, the tendency for opurculum gingivae to persist is greater. In these cases the tooth erupts partly into the retromolar mucosa. This mucosal tissue is more resistant to resorption than the future gingival tissue. Inflammation and considerable swelling may result from mechanical trauma or plaque accumulation at the site of the operculum. (Koch et al. 1991:272-273.)

2.6.2.3 *Granuloma pyrogenicum*

Pyrogenic granulomas result from chronic inflammation and proliferation of granulation tissue in the gums. They are formed when local irritation leads to injury of the gingival tissue and oral bacteria infect the tissue. This then forms a localized mass of fleshy tissue found mainly on the gum margins or dental papilla of the anterior aspect of the mouth. (Andlaw and Rock 1996:197.) Due to the vascularity of this granulation tissue, the colour ranges from deep red to purple. If the granuloma does not spontaneously resolve, surgical excision may be needed. (Ibsen and Phelan 1996:96.) Nunn (1993) describes a clinical case of a 2 year-old boy referred to dental hospital for complications of dental eruption. A

mass of fleshy tissue overlying the erupting tooth was ulcerated by the opposing tooth. Surgical excision was performed in view of a provisional diagnosis of a traumatized eruption cyst. After three weeks of unsuccessful treatment the mass had to be excised. The histopathology report on the excised tissue suggested that the lesion had been a pyrogenic granuloma rather than an eruption cyst.

2.6.2.4 Eruption cyst

Cysts of eruption are the most frequent local condition associated with eruption (Holloway and Swallow 1982:142). They are soft tissue cysts (Nunn 1993), usually seen over erupting primary molars (Andlaw and Rock 1996:136-137). Clinically an eruption cyst appears as a slightly raised, painless, bluish swelling, which is localized in the mucosa covering an unerupted tooth with no inflammatory changes in the soft tissue around it (Holloway 1982:142). The cyst may become painful only when infected or traumatized. (Andlaw and Rock, 1996:136-137). The space over the crown becomes filled with blood and tissue fluid and appears as a dark-bluish tense area (Parkin 1991:171). According to Anderson (1990), eruption cysts may be remnants of the dental lamina or epithelia coils, rising from the enamel organs after the occlusal enamel is formed, or simply by the accumulation of fluid and blood in an enlarged follicular space. In this case it is referred to as an eruption haematoma. Most eruption cysts usually resolve themselves by means of spontaneous

rupture (Andlaw and Rock 1996:137). Occasionally surgical intervention is initiated to remove the roof of the cyst and expose the crown of the underlying tooth (Parkin 1991:171). Nunn (1993) states that numerous textbooks on pediatric dentistry urge caution when contemplating surgical intervention of eruption cysts.

2.7 Signs and Symptoms

Since dentition is a natural physiological process, it should run a normal, uneventful course. This is, however, unfortunately not always the case, and those who deny the possibility of associated symptoms of difficult or abnormal dentition do so simply from an unwillingness to recognize the relation between cause and effect so manifest in these cases. (Raue 1990:125.)

Over the centuries a variety of symptoms and illnesses have been ascribed to teething (Goldbloom 1992:31), not only by doctors but by parents as well (Swann 1979). However, a diversity of opinions is still seen to be held by many practicing pediatricians. Leung (1989) suggests that this diversity exists since it is unclear as to whether the signs and symptoms are of a development origin, related to tooth eruption itself, or a result of the need for parents to explain behavioral changes occurring in the child with an anxiety-reducing diagnosis.

2.7.1 Systemic / General Disturbances

According to Ruddock (1990:175), general or local disturbances are likely to arise in delicate children in consequence of the increased activity and excitement in the vascular system, combined with the nervous irritation which sometimes attends dentition. Duncan (1991:259) suggests that since teething is a time of stress, the child's resistance to disease may be lowered. Edge (1986:217) explains that teething begins at an age when all the passive immunity to disease acquired from the mother has waned and the baby then becomes prone to every infection he encounters.

In 1969 a study was conducted by Tasanen to determine the disturbances associated with teething. This study involved 233 infants. The results showed that teething does not cause diarrhoea, sleep disturbances, and increase infection rate or temperature. Teething was however, found to cause an increase in daytime restlessness, drooling, finger sucking as well as a loss in appetite.

In 1972 a study to investigate general disturbances associated with teething, was carried out by Seward. In this study 4480 eruptions were observed in 224 infants. It was found that 87% of the infants experienced at least 1 general disturbance. It was also found that the disturbances tended to occur more frequently with posterior tooth eruption than with anterior tooth eruption. There were 5 general disturbances that were

noted to occur most frequently namely, thirst, decrease in appetite, irritability, drooling and disturbed sleep. In posterior tooth eruption, thirst occurred 87.5% of cases, decreased appetite in 91.5% , irritability in 96.8%, drooling in 90% and disturbed sleep in 82.1% of cases. In anterior tooth eruption thirst was only seen to occur in 44.2% of cases, decreased appetite in 49.5%, irritability in 69.2%, drooling in 53.5% and disturbed sleep in 62.5% of cases. However, these disturbances were still seen to be the most common.

Stoppard (1998: 241) suggests that other possible general symptoms of teething are, hyper salivation and dribbling, increased crying and clinginess as well as sleeplessness. Zand et al. (1994:386) also associates nasal congestion, colds, ear infections and raised temperature with teething. Whilst Gorrie et al.(1994: 604) include loose stools and diaper rashes in the list of general teething symptoms.

However, according to Illingworth (1982: 390) and Stoppard (1998: 241), there is no evidence that supports that bronchitis, diarrhoea, rashes, fever and vomiting are caused from teething and may even be symptoms of an underlying illness.

Of the many disturbances attributed to teething the greatest controversy exists over the relationship between teething and fever (Bennett and Brudno 1986).

2.7.1.1 Fever :-

Jaber et al. (1992) addressed the question of systemic symptoms and signs associated with teething by conducting a controlled investigation in a scientific manner. In this study the parents of 46 infants examined their infants' rectal temperature and gums for evidence of dental eruption, on a daily basis. The parents were also instructed to note any diarrhoea, convulsions, bronchial symptoms or any other diseases. Medications and medical examinations were also noted. These reports were then examined by the researchers. The results showed that temperature rose from 36.9 C, 19 days before eruption, to 37.6 C on the day the tooth erupted. The authors concluded that from the data presented it would seem that there is an association between fever and dental eruption. At the same time they also stress the danger in attributing fever to teething without ruling out other pathology.

In a study conducted by Bennett and Brudno (1986), a virus, known as the Human Teething Virus (HTV), was isolated by means of electron microscopy from more than 99% of the febrile infants participating in the study. This study showed that the HTV accounted for at least 84% of the fevers developed in infants during teething, thus the agent responsible for fevers associated with tooth eruption.

A survey conducted by Honig (1975), involved 70 practicing pediatricians in the metropolitan Philadelphia area in order to determine the signs and symptoms attributed to teething. Sixty-four Pediatricians responded and 12 felt that teething could cause a rise in temperature up to 39 C.

Gorrie et al. (1994: 604), however, claim that fevers during teething may be associated with an increase in susceptibility to illness due to poor eating and sleeping during teething, but are not normal symptoms of this condition. If teething is therefore used as an explanation for fevers, it may result in failure to diagnose a serious disease (Swann 1979).

2.7.1.2 Diarrhoea:-

Teething diarrhoea (TD) is another teething symptom causing much debate. A study conducted by Tasanen (1969), showed that out of 233 infants participating in the study, diarrhoea was only seen to occur in infants in the febrile eruption group and not in those in the non-febrile eruption group. Thus it was concluded that eruption does not cause diarrhoea.

In order to gain a better understanding of current medical opinion on teething diarrhoea, Coreil et al. (1995) conducted a cross-cultural survey in the USA. A total of 234 physicians who were registered members of the Florida Pediatric Society in 1990, were included. The survey showed

that 35% of these pediatricians associate the occurrence of diarrhoea with tooth eruption in infants and children. The most common explanations cited by these pediatricians were changes in eating habits, increased salivation, stress and coincidence. Additional attributed causes included viremia, bacteremia and change in parental behavior. Most respondents viewed TD as less serious than other types of diarrhoea and could be managed accordingly.

2.7.2 Local Disturbances

To determine the local disturbances attributed to primary dentition, Seward (1972) conducted a longitudinal study among 224 infants, which represented a study of 4480 separate episodes of primary tooth eruption. The aim was to establish the percentage of infants who experience local disturbances during primary tooth eruption as well as the frequency of the local disturbances.

From this study it was found that there were 5 local disturbances that most commonly occurred namely inflammation of the gums, circumoral rash, cheek flushing, mouth ulcers and eruption cysts. It was noted that inflammation of the gums is the most common local disturbance accompanying anterior tooth eruption. The duration of inflammation, however, was seen to vary from 2-10 days depending on the oral hygiene and general health of the infant. It was also noted that flushing of the

cheeks most commonly accompanied the eruption of the canines and the molars. Mouth ulcers were ranked third in occurrence in both anterior and posterior tooth eruption followed by cheek rash and then eruption cysts. The author noted that mouth ulcers were seen to occur due to sucking or placing of objects in the mouth, while a cheek rash may occur on one or both cheeks simultaneously and may be erythematous, papular or pustular in character as well as last for several days although not remaining at the same intensity for the whole period.

Petropulos (1986:248) suggests that the circumoral rash may be a direct result of the hypersalivation and drooling, associated with teething, irritating the surrounding tissue and producing an inflamed, red patch on the baby's cheek.

A recent survey was carried out by Chakraborty et al. (1994) on 201 infants from Calcutta, aged 6-12 months. In this study a questionnaire used to establish the localized disturbances associated with teething, revealed that the most common disturbances were the inflammation of the gums followed by flushing of the cheeks, ulcers in the mouth, cheek rash and eruption cysts. This survey thus supported and confirmed the hypothesis that primary dentition can be accompanied by local symptoms.

2.7.3 Physiological and Psychological Development.

Some practitioners put down the previously mentioned signs and symptoms to physiological and psychological development which occurs during the same developmental period as teething (Swann 1979). Due to this simultaneous development, it is difficult to distinguish those signs and symptoms that are related to teething from those of a normal developmental origin (Leung 1989).

Drooling and infantile eczema are seen to be normal occurrences for an infant at age 3-4 months (Swann 1979). At this age newly matured salivary glands produce an increase in salivary flow, which the infant fails to swallow and results in drooling. The saliva accumulates in the facial folds resulting in a moistened environment, which encourages the development of a circumoral rash. (Seward 1972.) According to Swann (1979), mouthing and biting of objects at the age of 6 months, as well as upper respiratory tract infections between the ages of 6 months and 3 years are also normal physiological developments. The association between various infections and teething is coincidental since the antibodies the infant received in utero are seen to be low during this period due to their disappearance at this time. This results in the infant being more susceptible to infections. (Gorrie et al. 1994:604.) Wakefulness, which is commonly experienced at 6-9 months, may be a result of separation anxiety and /or less need for sleep (Honig 1975).

Illingworth (1991: 78-79) claims however, that crying and sleep disturbances are in fact related to bad habit formation and parental mismanagement.

2.8 Treatment

2.8.1 Conventional treatment

Conventional treatment of teething includes topical analgesics, systemic analgesics, sedatives and hypnotics. Parental reassurance is also, always essential regardless of the treatment. (Leung 1989.)

2.8.1.1 Topical / local treatment :-

Teething toys, teething foods and/ or topical medications are all forms of local or topical teething treatment and may be used on their own or in conjunction (Andlaw and Rock 1996:135-136).

2.8.1.1a *Teething toys* :-

Teething infants have a natural tendency to chew or bite. This enables them to gain some relief from the pain that they may be experiencing. Teething toys are thus designed to satisfy these needs and come in a variety of shapes e.g. rings keys or rattles, all of which have no rough

surfaces to ensure that they do not cause an irritation in the mouth. (Andlaw and Rock 1996:135-136.) To prevent infection, parents must always ensure that the toys are clean, hard and smooth (Parkin 1991:170). It is also important that only reputable brands of teething toys be used as some of the cheaper ones may contain dyes with high levels of lead (Leung, 1989). According to Gorrie et al. (1994:604), if these teething toys are refrigerated before being used, they soothe inflammation that may be present in the gum. Moss (1993:18) suggests treating teething, locally, by simply cleaning the babies mouth with a damp gauze three or four times a day and giving them something to bite on such as a teething ring.

2.8.1.1b *Teething foods :-*

Teething foods such as rusks and hard biscuits serve the same purpose as teething toys. It is important to ensure that these foods do not contain sugar or sweetening. (Andlaw and Rock 1996:136.)

2.8.1.1c *Topical medication :-*

Topical treatment comes in the form of various ointments or jellies with one or more of the following properties, namely, local analgesic or anesthetic, anti-inflammatory, counter-irritant, anti-pyretic and antiseptic properties. Salicylates are the most common ingredient in these

preparations since they combine all of the a-fore mentioned properties, as well as providing a general analgesic effect. Local analgesics provide rapid yet short - lived pain relief. (Andlaw and Rock, 1996:136.) Parkin (1991:171), however, cautions that the salicylates they contain may give rise to salicylate poisoning if used too often. Other anti-inflammatory agents include menthol and myrrh tincture (Andlaw and Rock 1996:128).

Zand et al. (1994:386) recommends the application of Lidocaine or Benzocaine to the gums, to numb the area and thus act as a local anesthetic and provide temporary relief from teething pain. However, McDonald and Avery (1994:139) suggest that the use of local anesthetics in infants must be exercised with caution, since there is always a rapid systemic absorption of these drugs in infants, resulting in toxic doses.

Tanner and Kitchen (1964) found that a salve compound consisting of equal parts of 2.5% Xylocaine ointment, a topical anesthetic, and Orobace, an adhesive vehicle composed of gelatin, pectin, methylcellulose and plastibase was effective in controlling the pain associated with teething. This ointment was seen to offer relief 4-15 minutes after application until the next application was indicated 4-6 hours later.

A controlled, double blind, one year clinical trial carried out by Seward (1969), demonstrated the effectiveness of a teething solution, containing

a lignocaine mixture, in the relief of pain and discomfort associated with teething. It was also noted that this solution produced no side effects.

A common practice is the application of alcoholic beverages to the gums, to numb the area. This however, is not recommended since infants may swallow the alcohol. (Gorrie et al. 1994:604.) Zand et al. (1994:386) recommends the application of small amounts of clove oil to the gums, which acts as a natural anesthetic. This author also suggests the use of licorice root powder to soothe inflamed gums.

Antiseptics used include cetalkonium chloride, ethyl nicotinate, cetylpyridinium chloride, polyethoxdodecane and anthraquinone glycosides. These preparations are applied in order to control any infection that could occur at the site of eruption (Andlaw and Rock 1996:136.)

2.8.1.2 Systemic treatment :-

There are two main types of drugs used for systemic treatment of teething, namely general analgesics and hypnotics. These preparations however, should only be considered if local treatment has been ineffective. (Andlaw and Rock 1996:136.)

2.8.1.2a *General analgesics* :-

Zand et al. (1994:386) recommends the use of mild pain relievers such as acetaminophen or ibuprofen. These drugs however, should be used in small amounts i.e. age appropriate doses.

2.8.1.2b *Hypnotics and sedatives*

Andlaw and Rock (1996:136) suggest that the use of sedatives in conjunction with local or systemic analgesics may sometimes be necessary to restore normal sleeping patterns, but should, always, only be used as a last resort. Some authors recommend sedatives such as chloral and Dichloralphenazone elixirs to restore the baby's sleeping cycle and give the parents some rest. It is important to note however, that it is dangerous to sedate tiny children and it is believed that using an analgesic instead, would work just as well. (Parkin 1991:171.)

2.8.2 Homoeopathic Treatment :-

2.8.2.1 Introduction :-

Gay Gaer Luce, two-time winner of the National Science Writers Award, has proclaimed that, "homeopathy is a highly developed health practice that uses a systematic approach to the totality of a persons health.

Anyone seeking a fuller understanding of health and healing will find homeopathy extremely important and applicable." (Ullman 1991:xxxi.)

Homoeopathy is a gentle, holistic form of treatment, which respects each patient as being a unique individual. It therefore treats the individual and not the disease, which results in cure on a mental, emotional and physical level. (Hayfield 1993:9.) A person's unique pattern of symptoms are all interrelated. No matter what the individual symptoms are, they are recognized as primarily an intrinsic effort of the organism to adapt to and deal with various internal or external stresses. Homoeopathic medicines are prescribed to aid the organism in its sophisticated efforts to heal itself (Ullman 1991:28-29) and thus stimulate the immune system to promote healing and resolution of a morbid state (Castro 1997:31).

2.8.2.2 Similimum Treatment.

The basis of Homoeopathy is that the most successful remedy for any given occasion will be that one of whose symptomatology presents the clearest and closest resemblance to the symptom-complex of the sick person in question. In other words, "Let like be treated with like"(Lt. Similia Similibus Currentur). (Boyd 1989:2.) This means that medicine capable of producing certain affects when taken by a healthy human being is capable of curing any illness that displays similar effects. (Sankaran 1991:5.) This is possible since the similarity between the drug

presentation and the patient's symptom picture cancel each other out, allowing the patient to be restored back to health (Lockie and Geddes 1995:14).

Similimum treatment allows homoeopathy to respect the complexity and uniqueness of each individual (Zand et al. 1994:25) and thus the individuality of each patient or case (Yasgur 1998). This type of individualistic treatment differentiates one patient from the other while suffering from the same nosological condition or pathology (Yasgur 1998). The entire examination of a patient is conducted with a view to discover not only the general or common features of the case, but by the symptoms which differentiate that case from others of the same general case (Das 1998).

According to Shrivaka (1991), the cardinal point of difference between homeopathy and other systems lies in the application of remedies to sick patients in a "specialized" way. This implies: (1) The use of remedies whose properties and attributes have been previously ascertained through drug provings. (2) The use of a single remedy at a time, as the drug provings have been so conducted. Polypharmacy, therefore is irrational and unphilosophical. (3) The use of the small dose.

2.8.2.3 Perspectives of Homoeopathy in problematic primary dentition.

As more parents become worried about the excessive use of antibiotics in their young and the side effects, so more people are turning to homoeopathy as an alternative form of treatment (MacEion 1994:xiv,9). There is thus a growing opportunity to introduce homoeopathy as a safe, cost-effective treatment modality for the many common childhood illnesses (Jacobs 1994). This author also claims that homoeopathic treatment of children, from an early age, can prevent many paediatric problems and reduce their susceptibility to illness, by strengthening the overall defense mechanisms of the body, rather than suppressing the symptoms. It is thus the homoeopaths' job to facilitate the child's development, bolster immune system function, and create greater harmony in the body. This may require intervention at various points in the child's life. (Neustaedter 1991.)

Homoeopathy has seen to be successful in treating minor and common ailments in children (Jacobs 1994), especially since they are unaware of any social convictions and many of their symptoms have not yet been suppressed by excessive courses of antibiotics (MacEion 1994:xiii). Often homoeopathic medicines have proved to be useful for many of the reactions shown by children while teething (Clover 1990:60-61), for example, in the treatment of pain associated with teething as well as in

facilitating the eruption of teeth that have difficulty in breaking through the gums (Castro 1992:157). Often enough the symptoms and signs one sees in the oral cavity are early indications of more distant pathological processes in the gastro intestinal tract, the skin and its appendages (Steinlechner 1984:145). Thus, "Correct homoeopathic prescribing for dental maladies will frequently provoke salutary systemic effects. This is simply a reflection of the natural course of cure and illustrates the fact that the dental apparatus is an indivisible component of the integrated whole person." (Varley 1998:35)

Recent research on the homoeopathic treatment of teething, by clinical trial, has substantiated and conferred credibility to these claims. In a study carried out by Eldridge (1999), 15 teething infants were treated with a homoeopathic teething complex (Calcarea carbonica 15CH, Chamomilla 30CH, Kreosotum 30CH and Pulsatilla 30CH) another 15 teething infants were treated with a herbal teething gel (Plantago tincture, Verbascum tincture and Kava Kava tincture). The results showed that overall the homoeopathic complex was more effective than the herbal teething gel.

Another clinical trial carried out by Lever (1998), using a homoeopathic teething complex (Chamomilla 30CH, Belladonna 30CH and Scutellaria Lateriflora D6) proved the efficacy of this form of treatment in alleviating the symptoms of problematic teething. However since this study only

researched the efficacy of homoeopathic complex, it was suggested by the researcher that the use of Homoeopathic Similimum would yield better results. The reason for this suggestion is that it was found, by the researcher that the symptoms presented by each individual patient did not always correspond to the symptom picture of the remedies that constituted the complex being studied (Lever 1998). The use of the similimum remedy for each patient would allow for the recommended individualistic treatment. Since the similimum is that remedy that is most similar to the totality of symptoms (Dancu 1996).

2.8.2.4 Homoeopathic remedies used in the teething complex :-

2.8.2.4a *Chamomilla*:-

According to Raue (1990:126), *Chamomilla* is perhaps one of the most frequently employed remedies in teething disturbances. This remedy is especially useful for the infant that is very irritable, feels worse at night, worse with warmth, and is only comforted when carried around. The infant may also present with red, swollen gums that bleed easily and are sensitive to touch. (Zand 1994:386.) Vermeulen (1994:284 -289) describes the *chamomilla* patient as being peevish, restless, thirsty and hot, demanding instant relief from their pain yet remaining inconsolable. Infants needing *chamomilla* often have one red cheek as well as diarrhoea with a "rotten egg" smell, associated with teething (Morrison 1993:115-117).

2.8.2.4b *Belladonna*:-

Belladonna is a complementary remedy to *chamomilla* (Vermeulen 1994:161-168), since it is also well indicated for conditions in infants where there are outbursts of temper with shouting, throwing things around or even where the infant may try to bite their caregivers. The infant requiring *belladonna* will present with much fear and anxiety associated with this anger. (Clover 1990:63.)

Belladonna is indicated in inflammation characterised by redness, pain, throbbing, heat and oedema (Vermeulen 1994:161-168). The infant often has red, swollen gums and there may even be a tendency to convulsions (Raue 1990:126).

2.8.2.4c *Scutellaria Lateriflora* :-

The *Homoeopathic Medical repertory* (Murphy 1993:1438) lists *Scutellaria* as a remedy for difficult dentition with insomnia. This remedy is a sedative, indicated for nervous irritation and spasms of children, during dentition (Boericke 1993:577). *Scutellaria* is used to treat night terrors, restless sleep and sudden wakefulness (Vermeulen 1994:860). The teething infant requiring this remedy may also present with light coloured diarrhoea (Boericke 1993:578).

2.9 Summary

Teething has always been viewed as a major developmental stage in an infant's life and even though it is only one of the changes a baby is going through during this active period, it is teething and its associated problems, which still provoke the most worry in parents.

The distress, discomfort, irritability and sleepless nights associated with teething, makes this an extremely trying time for both infants and parents. This condition however, is still not considered to be a serious enough medical pathology to warrant the use of many of the potentially harmful and even unnecessary drugs prescribed for teething. As parental awareness of the side effects and long-term consequences of conventional treatment grows, so does the need for a safer alternative.

Homoeopathy has proved to be successful in alleviating the difficulties associated with teething whilst at the same time improving the overall constitution of the infant, thus making this approach a safe and effective alternative.

CHAPTER THREE: MATERIALS AND METHODS

The purpose of this study was to assess the response of teething infants to homoeopathic similimum treatment against a homoeopathic teething complex (Chamomilla 30CH, Belladonna 30CH and Scutellaria lateriflora D6). The relative effectiveness of similimum treatment could thus be evaluated.

3.1 Study design and Protocol

30 infants were selected for this research.

These infants were randomly divided into two groups namely "Similimum" group and "Complex" group. This was done in such a way that each patient had an equal chance of being selected for either of the groups.

The medication that was to be used was given to an independent dispenser. Thirty pieces of paper were numbered from one to thirty and placed in a box. The dispenser then drew the numbers out of the box one at a time and the first fifteen drawn placed on the similimum list and the second fifteen numbers drawn were placed on the complex list. The independent dispenser kept these lists so generated until the trial was

completed. As the patients entered the research they were numbered sequentially. The independent dispenser then gave to each patient either the similimum or complex treatment according to the list. This procedure ensured that neither the researcher nor the patient knew what form of treatment was used on each patient.

During the initial consultation, prospective infants were examined by the researcher in order to determine whether the infant fulfilled the selection criteria. A *Case taking form* (Appendix B), completed by the researcher, was used for this purpose. Careful attention was paid towards questions regarding the infant's teething and a thorough physical examination of the infant and the oral cavity was performed. Since this research used similimum treatment, extra emphasis was placed on the details of the case history and those signs and symptoms that individualised one case from the other.

The parents or guardians of the infants that fulfilled the criteria were then required to complete the *Consent form* (Appendix A).

The researcher then completed the *Teething questionnaire* (Appendix C) based on the information from the case history and answers given by the parents as well as the physical examination.

The treatment was then dispensed by the independent dispenser. The parent / guardian was asked to pay careful attention to the response of the patient to the medication with regards to all the signs and symptoms of teething, namely, the infants irritability, appetite, thirst, sleep patterns, salivation, stool consistency, biting /chewing, cheek flushing, circumoral rash as well as the appearance of the gums.

The follow-up consultation was performed four days later, due to the acute nature of the condition, where once again a *Case taking form* (Appendix B) as well as a *Teething questionnaire* (Appendix C) were completed by the researcher, as before, to assess of the treatment.

3.2 Subjects

Thirty infants between the ages of four months and two years were selected for the study.

The Selection criteria for the study was as follows:

INCLUSION CRITERIA

- Infants had to be between the ages of 4 months and three years of age.
- Infants had to be in the process of a tooth eruption. They therefore had to be within the first week of the approximate 3 week period, to decrease the possibility of changes recorded being the result of the natural end of dental eruption.(Lever 1998).
- Infants had to present with at least one sign or symptom each of the groups of general and local manifestations of problematic teething :

General Signs and Symptoms :-

Group one: Behavioral changes

Irritability

Daytime restlessness

Waking at night

Group two: Appetite and thirst

Decreased appetite

Increased fluid intake

Group three: Systemic changes

Loose stool with no signs of dehydration

Temperature less than 39 degrees Celsius

Local Signs and Symptoms :-

Group one:

Increased salivation

Drooling

Group two:

Circumoral rash

Flushed cheeks

Group three:

Biting of hard object / finger sucking

Redness and swelling of the gums

EXCLUSION CRITERIA :

An infant was excluded from the study if it was found, by the researcher, during the preliminary history and physical examination, to be exhibiting signs that could not be attributed to teething. These signs included:

Fever i.e. temperature > 39°C

Prolonged Severe diarrhoea

Dehydration

Lymphadenopathy

Neck stiffness, Kernig's sign and bulging fontanel

Pulse and respiratory rates that are higher than normal for the age of the infant or toddler, as defined by Heese (1995 681:685).

Any infant who was undergoing any other form of treatment or medication, which may or may not have been related to teething, was excluded from the study.

3.3 Treatment

All of the medication used for the study was obtained from a complete homoeopathic dispensary at the Natal Technikon Homoeopathic Day Clinic. The complex treatment consisted of powders medicated with lactose granules that had been impregnated with the teething complex. The similimum treatment consisted of powders medicated with lactose granules that were impregnated with the appropriate similimum remedy. This ensured that both the teething complex and the prescribed similimum remedy could be dispensed in powder form, by the independent dispenser. In this way both modes of treatment looked identical and only the dispenser knew which one was given, according to the list, which was previously drawn up.

3.3.1 Homoeopathic Similimum Treatment :

Similimum treatment was based on homoeopathic principles and each case was supervised as to the correct selection of the similimum. A careful and extensive case history was elicited from each patient's caregiver, by the researcher. This helped the researcher to select the appropriate similimum remedy, based on the totality of the symptoms presented by the patient. The patient's symptom picture was also

matched with the symptom picture of a selected remedy from the Homoeopathic Materia Medica in order to give the most accurate and similar prescription. Repertorisation on the computer program, RADAR, also provided confirmation of the appropriate similimum. There was no standardization on potency for the medication as it had to vary for each individual patient.

The independent dispenser was given a script for the similimum. The dispenser then medicated the powders with the teething complex or prescribed similimum, for each patient, according to the list that was previously drawn up. This ensured that neither the researcher nor the patient knew what mode of treatment was given. The patient's parents / guardians were then instructed on the administration of the remedy i.e. to be taken orally, under the tongue every four hours, whenever the patient was awake. The caregiver was also instructed to pay careful attention to the response of the patient to the remedy with regards to the patient's symptoms associated with teething.

3.3.2 Homoeopathic Complex Treatment :

The complex was prepared by impregnating lactose granules (carrier substance) with the following remedies: Chamomilla 30CH, Belladonna 30CH and Scutellaria lateriflora D6.

The impregnated lactose granules were then used to medicate the powders with the complex remedy. Complex treatment was administered in the same way as similimum treatment i.e. dissolved under the tongue every four hours, whenever the patient was awake, until the follow up consultation.

3.4 Measurements

The efficacy of the complex treatment versus similimum treatment was measured using a *Teething Questionnaire* (Appendix C). This questionnaire consisted of 11 variables, each one representing a different sign or symptom associated with teething. Each variable was allocated a rating of 0 (no sign or symptoms present) to 5 (sign or symptom very severe). This meant that with improvement the rating decreased. The questionnaire was completed by the researcher by questioning the parents / guardian as well as examining the infant. This procedure was

followed during the initial consultation as well as the follow up consultation 4 days later.

The questionnaire was designed by the researcher, based on the original questionnaires used by Eldridge (1999) and Lever (1998), for the original complex research. This questionnaire was used to determine the relative efficacy of complex treatment against similimum treatment, in terms of the management of the general and local manifestations of problematic teething in infants.

3.5 Statistical Analysis

For the purpose of this study, non-parametric methods for statistical data analyses had to be used. The reason for this being the small sample size per group ($n_1 = 15$, $n_2 = 15$). Data entry and analysis was performed using the statistical computer package SPSS version 9+.

GROUP ANALYSED

Group 1 constituted the Similimum group.

Group 2 constituted the Complex group.

3.5.1 The Mann-Whitney U-Test

The Mann-Whitney U - test was used to compare these two groups to one another, with respect to each variable of interest. The two groups were treated as being independent of one another (unpaired). The purpose of this test was to determine whether there was any significant difference between the two groups at the $\alpha = 0.05$ level of significance.

Hypothesis testing:-

The null hypothesis H_0 , states that there is no difference between the two groups with regards to questions 1 to 11 of the questionnaire. The alternative hypothesis H_1 states that there is a difference between the two groups or forms of treatment.

H_0 : Med 1 = Med 2 (There is no difference between the two groups or forms of treatments.)

H_1 : Med1 \neq Med2 (There is a difference between the two forms of treatments.)

$\alpha = 0.05$ = level of significance of test.

Decision rule:

For two – tailed test:

Reject H_0 if $P < \alpha$

Accept H_0 if $P \geq \alpha$

P is the observed significance level of the test. That is: P= (two-tailed z-value). (SPSS package version 9+.)

3.5.2. Wilcoxon's signed Rank Test

Two Wilcoxon's sign rank tests were used to determine whether there was any difference between the initial and follow up consultation, within each group, namely the simlimum treatment group and the Teething complex group. All tests were done at the $\alpha = 0.05$ level of significance.

Hypothesis testing: -

The null hypothesis H_0 , states that there is no improvement between the initial and follow-up consultation. The alternative hypothesis H_1 states that there is an improvement between the initial and follow-up consultation.

H_0 : There is no improvement between the initial and follow-up consultations within each treatment group.

H_1 : There is an improvement between the initial and follow-up consultations within each treatment group.

$\alpha = 0.05$ = level of significance of test.

Decision rule:

For a one-tailed test:

Reported P-value = SPSS print out value

Reject H_0 If $P = \text{reported P-value} \div 2 \leq \alpha$ {if H_a is of form $>$ and Z is +ve;
if H_a is of form $<$ and Z is -ve}

Alternatively

$$P = 1 - (\text{reported } P\text{-value} \div 2) \quad \left\{ \begin{array}{l} \text{if } H_a \text{ is of form } > \text{ and } Z \text{ is negative ; if } H_a \\ \text{is of form } < \text{ and } Z \text{ is positive } \end{array} \right\}$$

P is the observed significance level of the test. Reported p-value $\div 2$.
(SPSS package version 9+.)

3.5.3 Tables

The results of the Mann - Whitney Unpaired Test and the two Wilcoxon's signed rank test are demonstrated in the form of tables. A summary of the patient profile and the remedies prescribed is also tabulated.

3.5.4 Comparison using bar charts

Visual summaries of the analytical findings are given by means of bar charts.

3.5.5 Statistical package

The statistical package, Statistical Package for Social Sciences (SPSS) version 9+ was used for data entry and analysis.

CHAPTER FOUR: RESULTS

4.1 Introduction

This study used the Mann-Whitney Unpaired test with respect to 11 variables of interest in order to compare the two modes of treatment with each other.

The variables that were used were irritability, drooling, waking at night, chewing/biting, decrease in appetite, increase in thirst, diarrhoea, swollen gums, red gums, cheek flushing and circumoral rash.

For each of the 11 variables, two tests were done, as a result of which 22 P- values were obtained. For each of the 11 variables, the first P- value corresponds to the first test i.e. similimum treatment, and the second P- values corresponds to the second test i.e. complex treatment. The results of these tests have been demonstrated in table 1.

Wilcoxon's Signed Rank Tests were performed with respect to the 11 variables of interest, in order to compare the data within each individual group of treatment. There were two groups of treatment, namely homoeopathic similimum treatment and homoeopathic teething complex.

One test was performed per treatment type. These tests used information obtained by the researcher during the initial and follow up consultations.

Bar charts were used to: a) graphically demonstrate and measure whether or not the treatments yielded an improvement in the condition and to what extent. b) Compare the two modes of treatment to each other. c) Demonstrate to what extent each individual variable was affected by the different modes of treatment.

4.2 Criteria for the admissibility of the data

Only the data collected from this trial was accepted for use in the results chapter. The only data used in the analysis was collected in the manner described in chapter 3.

4.3 Tables

TABLE 1: Comparison between Similimum treatment (group1) and Complex treatment (group2). (Mann Whitney Test)

Question	Variable	Consultati	P-Value	H ₀
1	Irritability	Initial	0.863	Accept
		Follow-up	0.001	Reject
2	Hypersalivation	Initial	0.203	Accept
		Follow-up	0.177	Accept
3	Waking at night	Initial	0.981	Accept
		Follow-up	0.000	Reject
4	Chewing/ biting	Initial	1.000	Accept
		Follow-up	0.000	Reject
5	Decreased appetite	Initial	0.568	Accept
		Follow-up	0.003	Reject
6	Increased thirst	Initial	0.431	Accept
		Follow-up	0.037	Reject
7	Diarrhoea	Initial	0.216	Accept
		Follow-up	0.065	Accept
8	Swollen gums	Initial	0.375	Accept
		Follow-up	0.094	Accept
9	Redness of gums	Initial	0.237	Accept
		Follow-up	0.034	Reject
10	Cheek flushing	Initial	0.651	Accept
		Follow-up	0.001	Reject
11	Circumoral rash	Initial	1.000	Accept
		Follow-up	0.035	Reject
Total	Totals of variables	Initial	0.298	Accept
		Follow-up	0.000	Reject

The level of significance is fixed as $\alpha = 0.05$

Decision Rule: Reject H₀ if $P \leq 0.05$

Accept H₀ if $P > 0.05$

Conclusion for table 1

The table demonstrates that there was no statistical difference between similimum and complex treatment for the initial consultations with regards to all the variables since all were accepted. However, the table clearly demonstrates a marked difference between similimum treatment and complex treatment for the follow-up consultations with regards to 8 of the 11 variables, namely: irritability, waking at night, chewing/biting, decreased Appetite, Increased thirst, red gums and circumoral rash. There was no statistical difference between similimum and complex treatment for the follow-up consultations with regards to hypersalivation, diarrhoea, swollen gums and cheek flushing.

The totals in this table demonstrate that overall, there was no statistical difference between similimum and complex treatment for the initial consultation. There was however a marked statistical difference between similimum and complex treatment for the follow-up consultation.

TABLE 2: Comparison between initial and follow-up consultation for

Similimum treatment group

(Wilcoxon Sign Ranked Test: group1)

VARIABLE	P-VALUE	H ₀ DECISION
Irritability	0.001	Reject
Hypersalivation	0.001	Reject
Waking at night	0.001	Reject
Chewing/biting	0.001	Reject
Decreased appetite	0.001	Reject
Increased thirst	0.004	Reject
Diarrhoea	0.001	Reject
Swollen gums	0.001	Reject
Red gums	0.001	Reject
Cheek flushing	0.003	Reject
Circumoral rash	0.002	Reject
TOTAL	0.001	Reject

The level of significance is fixed as $\alpha = 0.05$

Decision Rule: Reject H₀ if $P = \text{reported p-value} \div 2 \leq \alpha$

Accept H₀ if $P = \text{reported p-value} \div 2 > \alpha$

Conclusion for table 2

The table demonstrates that there was a significant improvement between the initial and follow-up consultations for the similimum treatment group with regards to all the variables.

**TABLE 3: Comparison between initial and follow-up consultations
for Complex treatment group.**

(Wilcoxon's Sign Ranked Test: group 2)

VARIABLE	P-VALUE	Ho DECISION
Irritability	0.003	Reject
Hypersalivation	0.001	Reject
Waking at night	0.020	Reject
Chewing / biting	0.014	Reject
Decrease appetite	0.017	Reject
Increased thirst	0.014	Reject
Diarrhoea	0.004	Reject
Swollen gums	0.002	Reject
Red gums	0.002	Reject
Cheek flushing	0.102	Accept
Circumoral rash	0.011	Reject
TOTAL	0.001	Reject

The level of significance is fixed as $\alpha = 0.05$

Decision Rule: Reject H_0 if $P = \text{reported p-value} \div 2 \leq \alpha$

Accept H_0 if $P = \text{reported p-value} \div 2 > \alpha$

Conclusion for table 3

This table demonstrates that complex treatment produced a significant improvement between initial and follow-up consultations with regards to all the variables, except cheek flushing where there was no significant improvement.

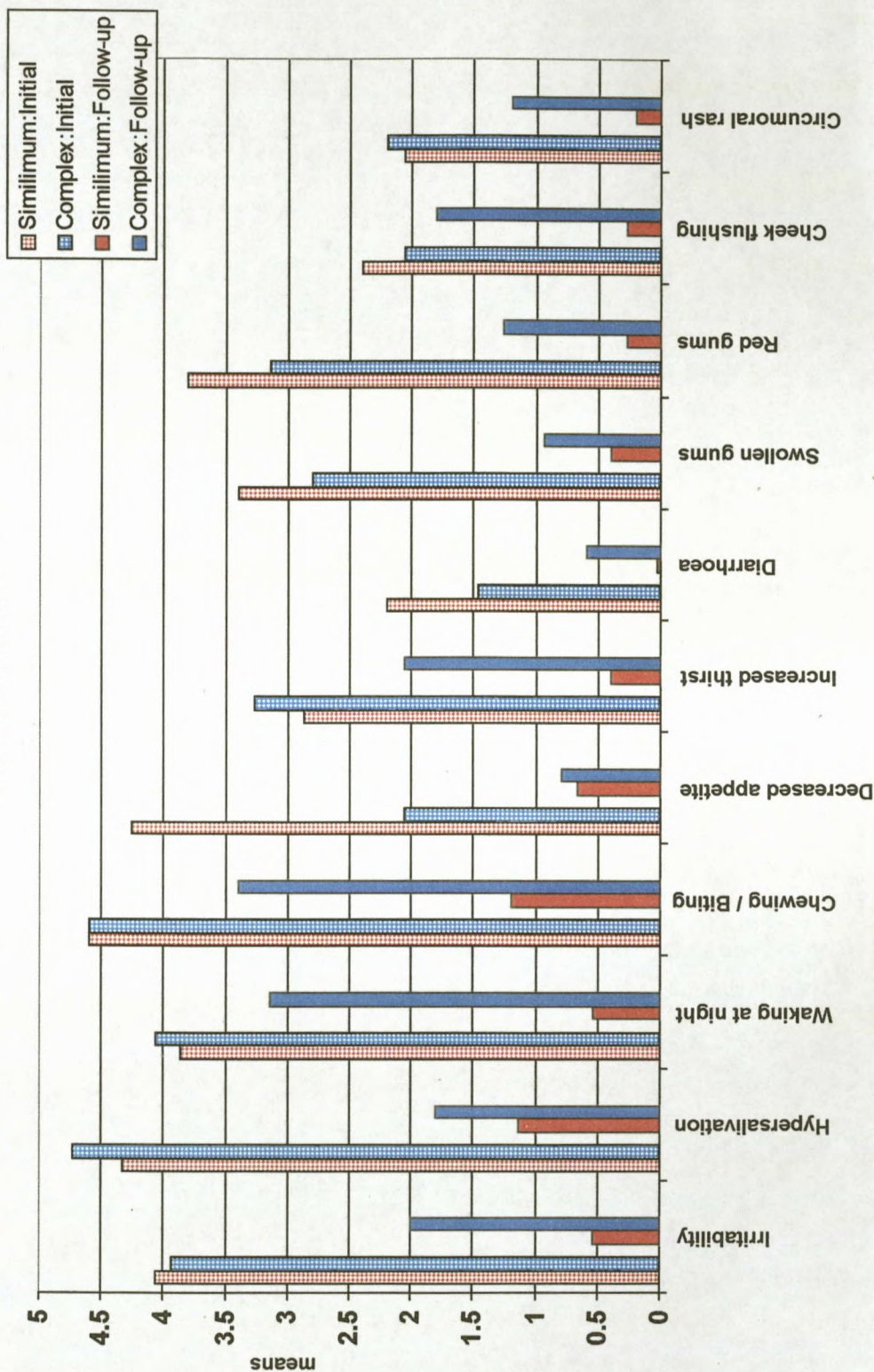
TABLE 4: Summary of patient profile including remedies.

Remedy	Indicated Similimum	Dispensed (Similimum group)	Not dispensed (Complex group)
Bryonia	1	1	0
Calcarea carbonica	2	1	1
Calcarea fluorica	1	0	1
Calcarea sulphurica	1	1	0
Chamomilla	1	1	0
Graphites	1	0	1
Helleborus niger	2	1	1
Magnesia carbonica	1	1	0
Natrum muriaticum	2	1	1
Natrum sulphuricum	1	0	1
Phosphorus	4	2	2
Pulsatilla pratensis	5	2	3
Staphysagria	1	1	0
Stramonium	1	1	0
Sulphur	5	2	3
Tuberculinum	1	0	1

The patient profile indicates that the most popular remedies prescribed were Pulsatilla pratensis and Sulphur (5 patients) followed by Phosphorus (4 patients). Other remedies that featured twice were Calcarea carbonica, Helleborus and Natrum muriaticum.

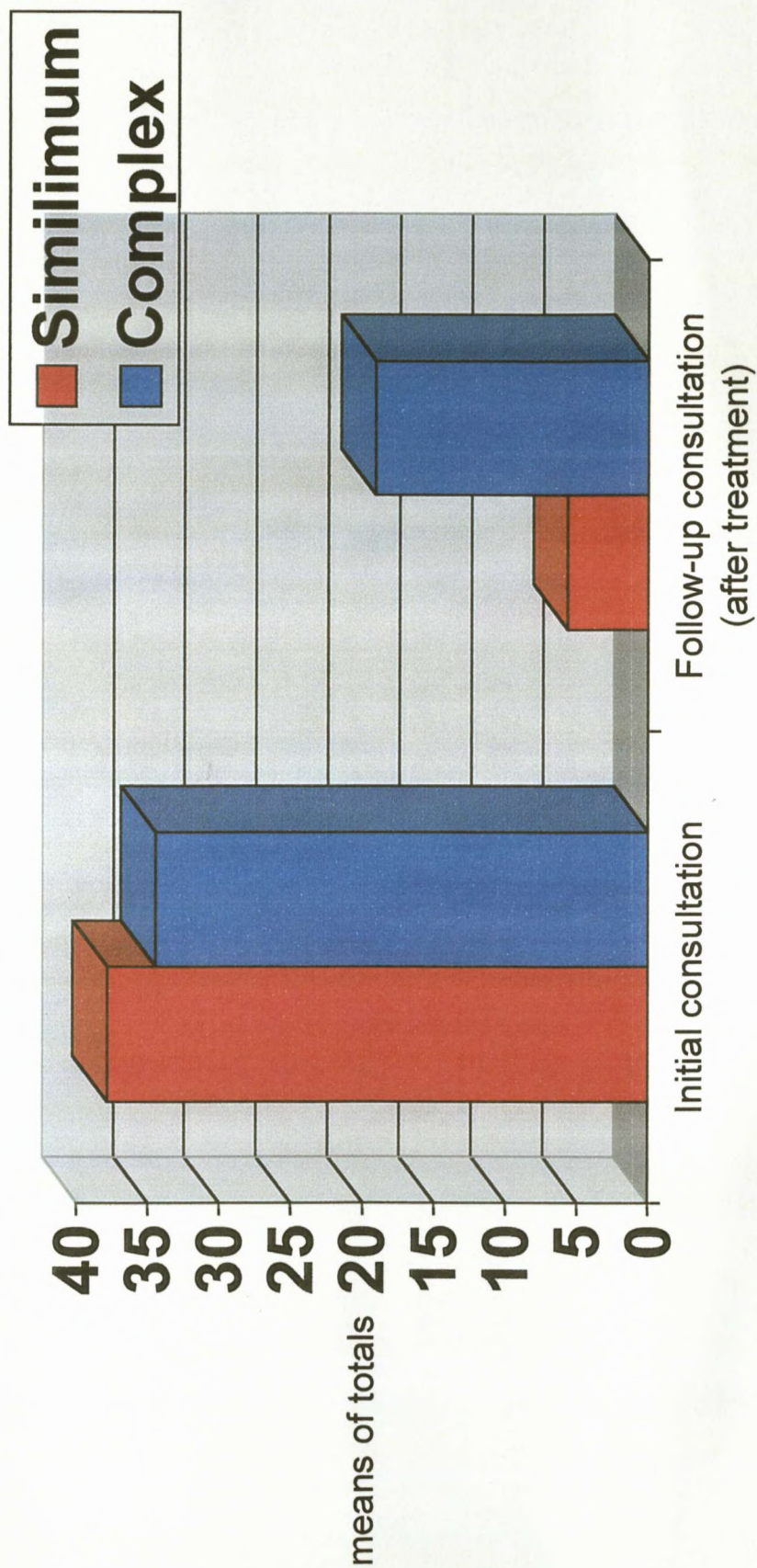
4.4 Bar Charts

Figure 1. Comparison between simlilimum and complex treatment groups with regards to the means of the 11 variables, for the initial and follow-up consultations



Clinical manifestations of teething (Teething questionnaire variables)

Figure 2. Comparison between similimum and complex treatments with regards to the means of the totals of the questionnaires for the initial and follow-up consultations



Conclusion for Bar charts / figures 1 and 2

The vertical axis in figures 1 and 2, represents the ratings used in the Teething questionnaire (*Appendix C*) to indicate the severity of the signs or symptoms. Severity increased from 0 (no signs or symptoms) to 5 (signs or symptoms very severe). Thus improvement of the signs and symptoms, is indicated by a lower rating.

The horizontal axis in figures 1 and 2 represents the 11 questions / variables in the Teething questionnaire (*Appendix C*). These variables represent the clinical manifestations of teething.

Bar chart / figure 1, demonstrates that there was an improvement between initial and follow-up consultations for both similimum and complex treatment groups. It also demonstrates that similimum had a much greater improvement than complex treatment with respect to all the variables (clinical manifestations of teething).

Bar chart / figure 2, demonstrates that with regards to the initial consultations, the similimum treatment group started off with more severe signs and symptoms than the complex treatment group and also had the greatest overall improvement in the follow-up consultation (after the treatment).

CHAPTER 5 : DISCUSSION

5.1. Interpretation and Argument

This study was designed to evaluate the relative effectiveness of Homoeopathic similimum against Homoeopathic complex in the treatment of problematic primary dental eruption.

The results of the study showed that both similimum and complex were effective in the treatment of problematic primary dentition.

Intergroup comparisons showed that there was no statistically significant difference between the two forms of treatment with respect to hypersalivation, swollen gums and diarrhoea. However, this study used a small sample size of only 15 patients in each group. Small trials, such as this require very large observed differences to be statistically significant (Lewith and Aldridge 1993). Therefore graphical comparisons between the similimum and complex treatment groups with regards to the means, were used to demonstrate that this study did demonstrate a difference between the two forms of treatment with respect to these disturbances.

Comparison between the two groups also showed that there was a marked statistical difference between similimum and complex treatment groups, after treatment, with regards to the other 8 disturbances (signs and symptoms of teething). These were irritability, waking at night, chewing and biting, decreased appetite, increased thirst, red gums, cheek flushing and circumoral rash. Since there was a significant improvement after treatment with regards to all the variables, in both treatment groups, it is evident that the difference between the two groups was that similimum treatment produced a greater improvement with regards to these 8 signs and symptoms.

This difference was also graphically demonstrated in bar chart / figure 1, by comparing similimum and complex treatment with regards to the means of the 11 variables (clinical manifestations of teething), for the initial and follow-up consultations. Since a lower value indicated improvement or reduction in the severity of the signs and symptoms, this bar chart clearly depicted that there was much greater improvement in the similimum treatment group compared to the complex treatment group, with respect to all the variables.

Figure 2 also demonstrated the superiority of similimum treatment over complex, by showing that despite the fact that the similimum treatment group started off (initial consultation) overall, with more severe teething

signs and symptoms than the complex treatment group, it still had the greatest overall improvement after treatment (follow-up consultation).

All the infants partaking in the study were seen to be chewing / biting to some degree. Chewing and biting is an attempt by the infant to reduce the pressure and discomfort of tooth eruption (Cohen et al. 1994:46). Both treatment groups showed a reduction of this disturbance. Similimum and complex treatment also resulted in significantly reduced irritability and waking at night, both of which are a result of discomfort associated with teething. It can thus be demonstrated that a general reduction in discomfort was achieved with both modes of treatment. Similimum treatment, however, produced the greatest improvement (figure1).

According to Leung (1989), the pain of teething leads to the irritability, restlessness and waking at night that is associated with tooth eruption. It can thus also be shown that both similimum and complex treatment reduced the pain of teething with the greatest improvement occurring in the similimum treatment group (figure1).

Complex treatment showed no improvement in cheek flushing. This concurs with the findings of Lever (1998). Similimum treatment, however, significantly reduced this disturbance.

Within the similimum treatment group the greatest improvement occurred in the reduction of the severity of the decreased appetite associated with teething. In many cases the appetite was returned to normal.

The severity of diarrhoea was reduced by the complex treatment and ceased completely in every case with the similimum treatment. Statistically, however, this disturbance showed the smallest difference between the initial consultation and follow-up for both treatment groups. This was due to the fact that most of the reported cases of diarrhoea were not very severe to begin with, especially since all infants that presented with diarrhoea that was too serious were excluded from the study. However, this study still supports the opinion that there is a relationship between teething and diarrhoea as was demonstrated by the mail survey conducted by Coreil et al. (1995). Since this disturbance improved together with a reduction in the severity of the drooling / hypersalivation, decreased appetite, irritability and waking at night, in both treatment groups, this research tends to support the opinions of Coreil et al. (1995) that the causes of diarrhoea are changes in eating habits, stress and hypersalivation. This study also concurs with the opinion of Petropulos (1986:248), that the increased secretions resulting from the process of tooth eruption produce a looser stool.

The circumoral rash, frequently associated with teething was improved by both similimum and complex treatment. A greater improvement was, once again, achieved with the similimum treatment (figure 3 and 4). Since this occurred together with a reduction in the severity of hypersalivation, this study supports Zand et al.(1994:386), Petropulos (1986:248) and most authors' suggestion, that the excess saliva irritates and chaps the surrounding skin resulting in a rash. Duncan (1991:259) proposes that a substance present in the baby's saliva may cause a rash on the cheeks, chin and neck. Even though this study suggests that this idea may be valid, more studies on the nature of the saliva itself would have to be conducted for any conclusions to be reached.

Inflammation of the gums was characterized by swelling (oedema) and redness of the gingiva. Similimum and complex treatment significantly reduced both the redness and the swelling of the gums, thus reducing the inflammation. Pain is always associated with inflammation. It can thus be deduced that a reduction in the pain associated with teething was also achieved with a greater improvement occurring in the similimum treatment group. These conclusions support the practices of Steinlechner (1984) and Varley (1998) who use Homoeopathy extensively in their dental practices, successfully treating conditions such as inflammation of the mucosa and gingiva, problematic dentition and even mental as well as physical trauma associated with dental pathology.

The patient profile (table 4) demonstrated that the most frequently prescribed and thus indicated remedies were Sulphur and Pulsatilla, followed closely by Phosphorus. It is quite significant to note that all the remedies used in the teething complex, except Chamomilla, were never indicated or prescribed. It is also relevant to note that of the 30 cases, Chamomilla was only prescribed once and this was in a different potency to that used in the complex.

All of the above observations as well as the marked success that similimum treatment had over complex treatment can only be explained by referring to and understanding some of the fundamental concepts and laws governing homoeopathy.

In Aphorism 153, Hahnemann explained that when prescribing a remedy that is based on the most individualising symptoms, a cure will always be achieved. Complex prescribing ignores these unique characteristics and thus individualising symptoms. The medicines chosen for a complex, correlate only to the clinical condition and its common symptoms. This correlation will usually be a loose one, which means that only a small percentage of patients will respond to one of the ingredients and this may only be a palliative response.¹ It can thus be seen why this research concurs with the suggestions made in previous studies, about the Homoeopathic treatment of Teething, by Lever (1998) and Eldridge (1999). As was speculated in both studies, homoeopathic similimum

treatment yielded better results than homoeopathic complex, because the symptoms presented by each individual patient did not always correspond to the symptom picture of the remedies that constituted the complex being studied. As a result of this sometimes-partial similarity, only partial alleviation of the signs and symptoms was achieved by the complex treatment.

Another problem with the complex treatment, which was not noted by the previous researchers, is that, "the remedies making up a complex, may have effects which are targeted at problems the patient does not have and which are not characteristic of the patient's constitution. This may then result in a proving of the complex and lead to unintended and even undesirable effects".¹ Although this phenomenon did not occur frequently enough in the complex treatment group to be of statistical significance, it may have contributed to the fact that complex treatment was not as effective as similimum.

All of the above only emphasize Hahnemann's view, " As the true physician finds in simple medicine, administered singly and uncombined, all that he can possibly desire...." (Aphorism 274).

It is remarkable how it is commonly assumed that everyone's pathologies present in exactly the same way and that the same drugs for everyone, will thus achieve a cure (Ullman 1991:9). In this study 16 different

remedies were prescribed for the treatment of teething. All were prescribed in different potencies. The teething complex, however, only contained 3 remedies, namely Chamomilla 30CH, Belladonna 30CH and Scutellaria lateriflora D6. Of the 3 remedies in the complex, only Chamomilla was prescribed and only once out of 30 cases. This was because the remedies prescribed were not only based on the signs and symptoms of teething, but on the characteristic way these symptoms presented themselves in each individual case. The signs and symptoms that made each case unique were the guiding indicators for the remedies chosen in each case. Only that remedy that matched and captured the characteristic essence of the individual's totality of symptoms was prescribed. In this study the effectiveness of similimum treatment over complex, serves to demonstrate why homoeopathy recognizes and caters for the vast differences between individuals and their relative pathologies, through its selective and individualistic prescriptions.

Specific teething remedies were used in the Teething Complex. Yasgur (1992:41) defines specific remedies as, "Remedies that are given for a particular symptom or disease without taking the whole person into account." Each homoeopath over a period of time seems to develop specifics for various acute ailments. But it is the indications on which the remedy is based, that matters most. (Shah 1994:17.) It is evident that proponents of complexes are focused on the particular form of pathology from which their patients are suffering. A particular pathology, they feel,

must require a particular remedy. This is in opposition to one of the central insights of the homoeopathic tradition, which is that the nature of the pathology is less important than the nature of the patient in his pathology¹. The findings of this research emphasize this view.

In Aphorism 275 Hahnemann explains, " The suitability of a medicine for any given case of disease does not depend on its accurate homoeopathic selection alone, but likewise on the proper size or smallness of the dose." This brings to light another problem with complex medicine and that is that the combinations will always have to come in fixed potencies. This means that the potency used, often cannot match the severity or present state of the case, thus rendering the treatment less suitable for each individual case and therefore less effective.

According to Hahnemann, in Aphorism 276, " Too large doses of an accurately chosen homoeopathic medicine, and especially when frequently repeated, bring about much trouble as a rule." We can thus see why complex prescription consisting of a single, frequently repeated dose, may complicate and even worsen the case. In Aphorism 281 Hahnemann explains how the potency must be adjusted together with the patient's state. All homoeopathic authorities have agreed that it is necessary to vary the potencies in some fashion, in order to keep the cure progressing. As the human system seems to desensitize very quickly to a given medicine in a given potency, repeated use of

combinations will most probably lead to stagnation of the case even if one or more of the medicines in the combination is acting.¹

Similimum treatment made it possible for different potencies to be used in each case and thus cater specifically to each case. In some instances varied potencies were used to maintain the progression of the cure. It can thus be seen why similimum treatment proved to be superior to complex.

Hahnemann pointed out one of the most important problems with complex medicines when he explained in Aphorism 274 that, "..... even though the simple medicines were thoroughly proved with respect to their pure peculiar effects on the unimpaired healthy state of man, it is yet impossible to foresee how two and more medicinal substances might, when compounded, hinder and alter each other's actions on the human body....."

This study serves to confirm the efficacy of single remedies over combination remedies and demonstrates why the last and foremost tenet of classical homoeopathy is the use of single remedies, the actions of which have been thoroughly tested and determined through clinical provings.

5.2 Speculation

A significant shortfall in the methodology of this trial was that the efficacy of the treatment was subjectively measured by monitoring the clinical manifestations of problematic primary dentition, using a Teething Questionnaire (*Appendix C*). This meant that the researcher had to rely on the parents' or guardians' ability to recall and rate the information required. Reassurance and education of the parents or guardians, offered by the researcher, before and after treatment, may have alleviated their anxiety in general. Love *et al.* (1989) was of the opinion that some patients reported more favorable results, in clinical trials, in an attempt to "please the therapist". All of the above may explain why both forms of treatment were effective in the management of teething.

Should further studies be conducted on the relative efficacy of similimum versus complex treatment, it is suggested that the accuracy of the results may be improved by introducing a control group through the use of placebo treatment.

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

6.1. CONCLUSIONS

Teething is a natural process of development in all children and is no longer viewed as a dangerous pathology. It may however, be a very trying and stressful time, mentally, emotionally and physically, for both child and parent. It is therefore important that improved forms of treatment are used, that not only provide fast, effective and lasting relief, but help prevent further illness by strengthening and supporting optimal health as well.

In this study the researcher attempted to evaluate the relative efficacy of Homoeopathic Similimum against a Homoeopathic Complex (Chamomilla 30CH, Belladonna 30CH and Scutellaria lateriflora D6) in the treatment of problematic primary dental eruption.

Subjective measurements were used to determine and compare the clinical manifestations of teething, before and after treatment.

A statistically significant improvement was observed in the complex treatment group. However, a much greater improvement resulted with similimum treatment. Considering all of the results it can be concluded that similimum treatment of problematic primary dentition was more effective than complex treatment.

6.2. Recommendations

It is recommended that should further studies be conducted on the relative efficacy of similimum versus complex, a placebo treatment group be used, as a control.

This study was conducted using a small sample size of thirty patients. Small trials require large observed differences to be statistically significant (Lewith and Aldridge 1993:21). It is thus recommended that in order to make the results more significant in future research trials, a larger patient base should be used.

Finally, it is recommend that a proper Homoeopathic clinical proving be conducted on the Teething complex used in this study. Only then can the efficacy and action of this complex be fully comprehended and demonstrated.

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APPENDIX A

COVER LETTER FOR INFORMED CONSENT FORM

PROBLEMATIC TEETHING IN INFANTS

Although teething is a natural process of development in all children, it may sometimes be a very trying time for both child and parent. Because the problematic teething process itself causes stress to the body, a teething infant is also more susceptible to illness. It so happens that teething begins at the age when all the passive immunity, against disease, which is received from the mother, has come to an end. This means that at this time the infant becomes more prone to every infection he encounters. For these reasons we are constantly looking for improved forms of treatment of problematic teething by finding a medication that not only provides fast and effective relief but one that can also help prevent further illness by strengthening and supporting optimal health in your child.

This research project will propose to determine the relative effectiveness of Homoeopathic Similimum (constitutional) treatment against a recently successful Homoeopathic Complex treatment in alleviating the signs and symptoms of this condition. In order to do this, we appeal to you for your assistance in allowing your baby to become actively involved, by informing us about their symptoms, their degree of intensity as well as how this condition has affected their daily lives.

The treatment will last for four days during which time the parents will be instructed as to the correct administration of the treatment as well as be requested to pay careful attention to all their child's signs, symptoms and behaviour throughout the course of the treatment. This will facilitate in accurate completion of the questionnaires, which will be filled in with the aid of the researcher on the initial and follow up consultations. The questionnaire will give you the opportunity to give your honest and objective contribution, enabling us to determine the effectiveness of Homoeopathic Complex treatment versus Homoeopathic Similimum treatment in problematic teething.

It is evident that there is a growing demand for effective, non-toxic treatment of this condition. With your help we will be able to determine the impact and relative effectiveness of Homoeopathic Complex versus Similimum treatment, in problematic teething.

Thank you for the courtesy of your time and assistance.

Orly Moyal

INSTRUCTIONS FOR TEETHING QUESTIONNAIRE

- A. All answers to the questionnaires will be regarded with strict confidentiality and used for research purposes only.
- B. Please, answer questions as objectively as possible.
- C. Please, make sure you understand every question. If you have any queries, please ask for clarification or assistance from the researcher.

PATIENT CONSENT FORM

TITLE OF RESEARCH PROJECT:

The efficacy of Homoeopathic Similimum compared to a Homoeopathic Complex in the treatment of problematic primary dental eruption.

NAME OF SUPERVISORS:

Dr AHA ROSS

NAME OF RESEARCH STUDENT:

Orley Moyal

DATE:

(PLEASE CIRCLE THE APPROPRIATE ANSWER)

- | | | |
|----|--|--------|
| 1. | Have you read the research information form? | YES/NO |
| 2. | Have you had the opportunity to ask questions regarding this study? | YES/NO |
| 3. | Have you received satisfactory answers to your questions? | YES/NO |
| 4. | Have you had the opportunity to discuss this study? | YES/NO |
| 5. | Have you received enough information about this study? | YES/NO |
| 6. | Who have you spoken to?..... | |
| 7. | Do you understand the implications of your involvement in this study? | YES/NO |
| 8. | Do you understand that you are free to withdraw from this study at any time? | YES/NO |
| 9. | Do you agree to participate in this study? | YES/NO |

If you have answered no to any of the above, please obtain the information before signing.

I hereby give consent for
the proposed procedure to be performed on me as part of the above mentioned research project.

WITNESS NAME:SIGNATURE:.....

RESEARCH STUDENT:Orley Moyal.....SIGNATURE:

APPENDIX B – CASE TAKING FORM

CASE TAKING FORM FOR TEETHING RESEARCH

INFANTS DETAILS: -

Name _____ Date _____

Address _____

_____ Code _____

Date of Birth _____ Age _____ Sex: M / F

Consultation: initial / follow up

PARENTS' DETAILS: -

Name of parent(s) / guardian(s) _____

Telephone (H) _____ (W) _____

MAIN COMPLAINT: _____

PAST MEDICAL HISTORY AND TREATMENT: (including childhood diseases): _____

Medication: _____

Vaccinations: _____

Allergies: _____

FAMILY HISTORY:

BIRTH HISTORY: Pregnancy _____

Labour _____

MILESTONES: _____

GENERALS:

Sleep: (patterns and positions) _____

Weather preference: _____

SYSTEMS REVIEW:

HEAD: _____

ENT: Ears _____

Nose _____

Throat _____

RESPIRATORY: _____

CARDIOVASCULAR: _____

GIT: Feeding / diet _____

Cravings and aversions _____

Appetite _____

Thirst _____

Stool (colour, consistency, frequency) _____

GENTO-URINARY: _____

Urine _____

Discharges _____

MUSCULOSKELETAL AND CNS: _____

SKIN: Rashes _____

Perspiration _____

PERSONALITY: Temperament _____

Relations with others _____

Fears _____

PHYSICAL EXAMINATION

VITAL SIGNS:

Temperature _____

Pulse rate _____

Respiratory rate _____

Weight _____

Head circumference _____

GENERAL EXAMINATION:

Jaundice / anaemia / cyanosis

Dehydration Oedema _____

Lymphadenopathy _____

Neck stiffness / Kernig's sign _____

Fontanelles _____

ENT: Ears: Right _____

Left _____

Throat _____

Nose _____

ORAL EXAMINATION: _____

Gums/mucosa _____

Salivation _____

Number of teeth erupting _____

CHEST EXAMINATION: _____

Deformities _____

Lungs _____

Heart _____

ABDOMINAL EXAMINATION: _____

APPENDIX C – TEETHING QUESTIONNAIRE

TEETHING QUESTIONNAIRE

NAME: PATIENT NO.

AGE: DATE:

SECTION A – (GENERAL QUESTIONS):-

The following questions relate to the last 24 – 48 hours compared to the infant's norm.

1. Is your baby irritable?		Initial	Follow up
If yes, is it:		Yes/No	Yes/No
o	Most of the day	5	5
o	2-3 times a day	3	3
o	Once a day or less	1	1
2. Is your baby drooling/hypersalivating?		Initial	Follow up
If yes, is it:		Yes/No	Yes/No
o	Excessive	5	5
o	Moderate	3	3
o	Slight	1	1
3. Is your baby waking at night?		Initial	Follow up
If yes, is it:		Yes/No	Yes/No
o	Most of the night	5	5
o	2-3 times a night	3	3
o	Once a night	1	1
4. Is your baby sucking / biting his or her hands, fingers or toys?		Initial	Follow up
If yes, is it:		Yes/No	Yes/No
o	Most of the day	5	5
o	2-3 times a day	3	3
o	Once a day or less	1	1
5. Has your baby's appetite decreased?		Initial	Follow up
If yes, is it:		Yes/No	Yes/No
o	Excessive	5	5
o	Moderate	3	3
o	Slight	1	1

	Initial	Follow up
Yes/No	Yes/No	Yes/No
6. Has your baby's thirst increased?	5	5
- If yes, is it:	3	3
◦ Excessive	1	1
◦ Moderate		
◦ Slight		

	Initial	Follow up
Yes/No	Yes/No	Yes/No
7. Does your baby have diarrhoea?	5	5
- If yes, is it:	3	3
◦ Severe	1	1
◦ Moderate		
◦ Slight		

SECTION B – (ORAL EXAMINATION – to determine the severity of the eruption):-

	Initial	Follow up
Yes/No	Yes/No	Yes/No
1. Is the gum around the erupting tooth swollen?	5	5
- If yes, is it:	3	3
◦ Severe	1	1
◦ Moderate		
◦ Slight		

	Initial	Follow up
Yes/No	Yes/No	Yes/No
2. Is the gum around the erupting tooth red?	5	5
- If yes, is it:	3	3
◦ Very red	1	1
◦ Moderately red		
◦ Slightly red		

	Initial	Follow up
Yes/No	Yes/No	Yes/No
3. Is your baby's cheek(s) flushed?	5	5
- If yes, is it:	3	3
◦ Very red	1	1
◦ Moderately red		
◦ Slightly red		

	Initial	Follow up
Yes/No	Yes/No	Yes/No
4. Is there a rash around your baby's mouth?	5	5
- If yes, is it:	3	3
◦ Severe	1	1
◦ Moderate		
◦ Slight		

APPENDIX D: Descriptive statistics for bar charts

Descriptive Statistics for Similimum treatment (group1).

	N	Minimum	Maximum	Mean	Std. Deviation
Q1initial	15	1	5	4.0667	1.2799
Q1F/up	15	0	3	.5333	1.0601
Q2 initial	15	3	5	4.3333	.9759
Q2 F/up	15	0	3	1.1333	1.0601
Q3 initial	15	0	5	3.8667	1.6417
Q3F/up	15	0	3	.5333	.8338
Q4initial	15	3	5	4.6000	.8281
Q4F/up	15	0	5	1.2000	1.2649
Q5initial	15	0	5	4.2667	1.6242
Q5F/up	15	0	3	.6667	1.2344
Q6initial	15	0	5	2.8667	2.1336
Q6F/up	15	0	1	.5000	.5071
Q7initial	15	0	5	2.2000	1.6125
Q7F/up	15	0	1	6.67e-02	.2582
Q8initial	15	1	5	3.4000	1.5492
Q8F/up	15	0	1	.4000	.5071
Q9initial	15	1	5	3.8000	1.4736
Q9F/up	15	0	1	.2667	.4577
Q10initial	15	0	5	2.4000	1.8048
Q10F/up	15	0	3	.2667	.7988
Q11initial	15	0	5	2.0667	1.4376
Q11F/up	15	0	1	.2000	.4140
ValidN(listwise)	15				

Descriptive Statistics for Totals of Similimum Treatment

	N	Minimum	Maximum	Mean	Std. Deviation
Initial totals	15	22.00	53.00	37.8667	8.4926
Follow-up totals	15	1.00	19.00	5.6667	5.7030

Descriptive Statistics for Complex Treatment (Group 2).

	N	Minimum	Maximum	Mean	Std. Deviation
Q1initial	15	1.00	5.00	3.9333	1.2799
Q1F/up	15	.00	5.00	2.0000	1.3628
Q2 initial	15	3.00	5.00	4.7333	.7037
Q2 F/up	15	.00	5.00	1.8000	1.4243
Q3 initial	15	3.00	5.00	4.0667	1.0328
Q3F/up	15	1.00	5.00	3.1333	1.4075
Q4initial	15	3.00	5.00	4.6000	.8281
Q4F/up	15	1.00	5.00	3.4000	1.5492
Q5initial	15	.00	5.00	2.0667	1.9074
Q5F/up	15	.00	5.00	.8000	1.4243
Q6initial	15	.00	5.00	3.2667	2.1865
Q6F/up	15	.00	5.00	2.0667	2.1536
Q7initial	15	.00	3.00	1.4667	1.1872
Q7F/up	15	.00	3.00	.6000	1.0556
Q8initial	15	.00	5.00	2.8000	1.8593
Q8F/up	15	.00	3.00	.9333	.9612
Q9initial	15	1.00	5.00	3.1333	1.5976
Q9F/up	15	.00	5.00	1.2667	1.5337
Q10initial	15	.00	5.00	2.0667	1.7915
Q10F/up	15	.00	5.00	1.8000	1.7403
Q11initial	15	.00	5.00	2.2000	1.9346
Q11F/up	15	.00	5.00	1.2000	1.5675
ValidN(listwise)	15				

Descriptive Statistics for Totals of Complex treatment.

	N	Minimum	Maximum	Mean	Std. Deviation
Initial totals	15	25.00	47.00	34.4667	7.5486
Follow-up totals	15	8.00	39.00	19.1333	8.5345